Proceedings of the
American Association of Textile Chemists and Colorists

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Editor of Proceedings: Carl Z Draves, 30 Lahey St, New Hyde Park, N Y

MARCH 16, 1953

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EMPLOYMENT REGISTER

This column is open for two insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the Secretary.

53-4

Education: BS, chemistry with additional business training

Experience: textile chemist

Age: 37; married; references; administrative or supervisory position desired

3-2, 3-16

53-5

Education: BS, Chemistry & Dyeing; honor student

Experience: textile chemist and dyer

Age: 27; married veteran; references; New England preferred

3-2, 3-16

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South Central Section Meeting Report

THE winter meeting of the South Central Section was held at Patten Hotel, Chattanooga, Tenn, on February 28.

The technical session was held in the afternoon and attended by approximately forty members. E E Burgner, Chairman, opened the meeting and introduced the speaker, W H Ridley of The Foxboro Company, Foxboro, Massachusetts. Mr Ridley delivered a paper entitled "Control Instruments and Their Application for Modern Dyehouse Operation".

A banquet was held in the evening with approximately 75 in attendance. Guest speaker was Dr Irwin W Grote of the University of Chattanooga.

Respectfully submitted,

JOE T BOHANNON, JR, *Secretary*

In response to many requests AATCC has made reprints of Part III of the *1952 Technical Manual and Year Book*, which contains the official Association test methods. The reprints are suitably bound for use in the laboratory. Copies are available from the Secretary, H C Chapin, Lowell Textile Institute, Lowell, Massachusetts, at a cost of $1.00.

CALENDAR

AATCC

COUNCIL
April 17 (New York), June 5 (Washington).

GENERAL RESEARCH COMMITTEE
April 17, June 5.

NATIONAL CONVENTIONS
September 17-19, 1953 (Hotel Conrad Hilton, Chicago); 1954 (Atlanta, Ga); Sept 21-23, 1955 (Chalfonte-Haddon Hall, Atlantic City, N J).

HUDSON-MOHAWK SECTION
COUNCIL
April 17, June 5.
March 20, May 8 (Albany); June 19 (Outing).

MID-WEST SECTION
April 18 (Netherland Plaza, Cincinnati, O); June 13 (Outing, Lake Delavan, Wis); November 7 (Hotel Bismarck).

NEW YORK SECTION
April 17 (Fairleigh Dickinson College, Rutherford, N J); May 22 (Kohler's Swiss Chalet, Rochelle Park, N J); June 19 (Outing, North Jersey CC, Wayne, N J).

NORTHERN NEW ENGLAND SECTION
April 17 (Lowell Textile Inst, Lowell); May 15 (Andover CC, Andover); June 12 (Annual Outing); Nov 6 (LTI); Dec 4 (MIT Faculty House).

PHILADELPHIA SECTION
April 17 (Hotel DuPont, Wilmington, Del); May 22 (Outing, Manufacturers Golf & Country Club); Sept 11; Oct 23; Dec 4; Jan 15, 1954.

PACIFIC SOUTHWEST SECTION
April 24 (Nikabob Cafe, Los Angeles).

PIEDMONT SECTION
April 11, (Robert E Lee Hotel, Winston-Salem, N C); June 12-13 (Mayview Manor, Blowing Rock, N C); Sept 12 (Hotel Charlotte, Charlotte, N C).

RHODE ISLAND SECTION
Mar 27 (Providence Eng Soc); Apr 24 (Wannamoisett C C); May 22 (Prov Eng Soc); June 12 (Outing, Wannamoisett C C); Oct 23 (Prov Eng Soc); Dec 4 (Annual Meeting, Sheraton - Biltmore, Providence).

SOUTH CENTRAL SECTION
May 23 (Patten Hotel, Chattanooga, Tenn); Aug 21-22 (Outing, Chattanooga Golf & Country Club, Chattanooga, Tenn); Dec 5 (Patten Hotel).

WESTERN NEW ENGLAND SECTION
Mar 20 (Rapp's Restaurant, Shelton, Conn); May 8 (Ladies Night); June 19 (Outing); Oct 2, Nov 6 and Dec 11 (Rapp's).

A J Gard to Address WNE Section

THE next meeting of the Western New England Section will be held Friday, March 20th at Rapp's Restaurant, Shelton, Conn.

Guest speaker of the evening will be Andrew J Gard, Bersworth Chemical Company, on the subject "Chemistry of Chelation". His talk reportedly will embody material on preferential chelation, commercially available organic chelating agents, and the application of chelation to cotton and wool dyeing processes.

COMING EVENTS OF OTHER ORGANIZATIONS

AMERICAN CHEMICAL SOCIETY
123rd National Meeting, March 16-20, Los Angeles, Calif; Textile Symposium (sponsored by the Chemical Marketing and Economics Division), March 18, Hotel Statler, Los Angeles, Calif.

AMERICAN OIL CHEMISTS' SOCIETY
44th Annual Meeting, May 4-6, Roosevelt Hotel, New Orleans, La; 27th Fall Meeting, November 2-4, Sherman Hotel, Chicago, Ill.

AMERICAN SOCIETY FOR QUALITY CONTROL
Textile Division: May 27-29, Convention Hall, Philadelphia, Pa.

AMERICAN SOCIETY FOR TESTING MATERIALS
Committee D-13 on Textile Materials: March 18-20, Park Sheraton Hotel, New York, N Y; 1953 Annual Meeting, June 29-July 3, Chalfonte-Haddon Hall, Atlantic City, N J; 1953 Fall Meeting, Oct 14-16, New York, N Y.

AMERICAN TEXTILE MACHINERY ASSOCIATION
Exhibit of American Textile Machinery, April 26-May 1, 1954, Atlantic City Exhibition Hall, Atlantic City, N J.

ASSOCIATION OF CONSULTING CHEMISTS AND CHEMICAL ENGINEERS, INC
April 21 (Hotel Belmont Plaza, New York, N Y—Symposium and Dinner); Annual Meeting—25th Anniversary-October 27 (Hotel Belmont Plaza, New York).

COMMERCIAL CHEMICAL DEVELOPMENT ASSOCIATION
Meeting: March 23, Hotel Statler, New York, N Y.

CANADIAN ASSOCIATION OF TEXTILE COLOURISTS AND CHEMISTS (Quebec Section)
Mar 21 (Physical Science Centre, McGill Univ, Montreal, Que); April 17-18 (Annual Meeting, Mount Royal Hotel, Montreal, Que); June 20 (Annual Golf Tournament).

GARMENT DYERS GUILD OF AMERICA
1953 Technical Clinic, November, Seneca Plant, Rochester, N Y.

INTERNATIONAL FEDERATION OF TEXTILE CHEMISTS AND COLORISTS ASSOCIATIONS
1953 Congress: September 17-19, Luzern, Switzerland (under the auspices of the Swiss Association of Chemists-Colorists).

LOWELL TEXTILE INSTITUTE ALUMNI ASSOCIATION
All-Alumni Reunion, May 22 (Boston) and May 23 (Lowell).

NATIONAL ASSOCIATION OF HOSIERY MANUFACTURERS
41st Knitting Arts Exhibition, April **27-May 1, Atlantic City Auditorium, Atlantic City, N J.**

NEW BEDFORD TEXTILE INSTITUTE ALUMNI ASSOCIATION
Annual Homecoming & Clambake, June 6, New Bedford, Mass.

NEW YORK BOARD OF TRADE (DCAT)
Drug, Chemical and Allied Trades Section; 63rd Annual Meeting, Sept 24-27, Pocono Manor Inn, Pocono Manor, Pa.

PHI PSI FRATERNITY
50th Convention, May 7-9, Penn-Sheraton Hotel, Philadelphia, Pa.

PENNSYLVANIA STATE COLLEGE, SCHOOL OF HOME ECONOMICS
Annual Spring Weekend, April 17-18, State College, Pa.

PURDUE INDUSTRIAL WASTE CONFERENCE
8th Conference, May 4-6, Purdue University Memorial Union Building, Lafayette, Ind.

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
June 11-13 (Joint Outing with Manufacturing Chemists' Association at The Greenbrier, White Sulfur Springs, W Va.

TEXTILE RESEARCH INSTITUTE
1953 Annual Meeting, Nov 12-13.

TEXTILE WORKSHOP
3rd Annual Meeting: June 10-July 1, Lowell, Mass.

"THE APPLICATION OF VAT DYES"

Monograph No 2

American Association of Textile Chemists and Colorists

MONOGRAPH NO 2, dealing with "The Application of Vat Dyes" has been prepared by a Board of Editors and Collaborators in the American Association of Textile Chemists and Colorists. This group represents a complete cross-section of the entire industry so that the text of the Monograph will represent latest information both from laboratory and practical plant standpoints.

The Monograph will contain approximately 385 pages with contents of various chapters as follows:

I *HISTORY*—Natural Indigo and Tyrian Purple; Development of Synthetic Vat Dyestuffs; History of Application of Vat Dyes; The Application of Vat Dyes to Fibers Other Than Cotton.

II *PRINCIPLES OF VAT DYE APPLICATION*—Types and Forms of Vat Dyes in Commerce; Chemistry of Application; Stripping and Redyeing Faulty Vat Dyeings; Fastness; Print Discharges; Change of Shade in Artificial Light; Dichroic Dyes.

III *APPLICATION TO COTTON RAW STOCK*—Equipment Used; Methods of Color Application; Typical Examples.

IV *APPLICATION TO COTTON SKEINS*—Equipment and Methods.

V *APPLICATION TO COTTON WARPS*—Short Chain Method; Long Chain Warp Dyeing; Continuous Pigment Padding Method.

VI *APPLICATION TO COTTON PACKAGES*—The Package; Package Dyeing Machines; Chief Factors in Dyeing Packages with Vat Dyestuffs; Dyeing Speed and Levelling Power of Vat Dyes; Dyeing Methods; Oxidation and Finishing; Vat Dyeing on Beams; Illustrative Dyehouse Procedures.

VII *APPLICATION TO COTTON PIECE GOODS*—History; Jig Methods; Padding Methods; Continuous Methods; Overhead Reel Method; Vat Dyeing of Cotton Narrow Fabrics.

VIII *HOSIERY*—Application of Colors to Cotton Hosiery; Application of Colors to Mixed-Fiber Hosiery.

IX *APPLICATION TO FIBERS OTHER THAN COTTON*—Vat Dyeing of Viscose Rayon; Vat Dyeing of Cellulose Acetate; Vat Dyeing of Nylon; Vat Dyeing of Animal Fibers.

X *GENERAL PRINCIPLES OF PRINTING*—Piece Goods; Forms Other Than Piece Goods.

XI *PRINTING*—Direct Printing with Vat Dyestuffs; Discharge Printing with Vat Dyestuffs; Goods Dyed After Printing.

XII *INDIGO*—History and Properties; Various Indigo Vats and their Preparation; Dyeing of Cotton with Indigo; Dyeing of Wool with Indigo; Application of Indigo to Cotton Printing; Indigo Derivatives.

XIII *THE USE OF VAT DYES AS PIGMENTS OR IN NONTEXTILE APPLICATIONS*—Paper; Rubber, Plastics and Resins; Fireworks; Paints and Lacquers; Resin-Bonded Pigments; Miscellaneous.

XIV *LEUCOESTERS OF VAT DYESTUFFS*—History and Chemistry; Properties; Application of Leucoesters; Light Fastness of Leucoesters; Relative Costs of Vat and Soluble Vat Dyeing.

XV *TABULATION OF VAT DYESTUFFS*—Formulae and Properties; Numerical Index; Alphabetical Index; Trade Names of American-Made Vat Dyes.

AUTHOR INDEX

SUBJECT INDEX

From the foregoing, it is seen that this Monograph will give a very comprehensive description of all of the factors involved in the application of vat dyes. In all discussions of application procedure, practical working formulas are given. This publication will, undoubtedly, be of interest to all persons who are either producers or consumers of vat dyes.

SPECIAL PREPUBLICATION PRICES

The price of "The Application of Vat Dyes" after publication will be $5 per copy, postpaid, to members, students and book stores; to nonmembers it will be $6 per copy. As a special inducement, prepublication orders will be accepted until April 15th at the reduced rate of $4.50 per copy, postpaid, to members, students and book stores and of $5.50 per copy to nonmembers. Please use the order form at the bottom of this page.

(This order must be received by April 15, 1953)

Students who are nonmembers must have their orders certified by the educational institutions in which they are enrolled.

Dr H C Chapin, National Secretary
American Association of Textile Chemists and Colorists
P O Box 28, Lowell, Massachusetts

Enclosed is my check for $..... covering payment of ..... copies of "The Application of Vat Dyes" at $4.50 per copy.

Enclosed is my check for $..... covering payment of ..... copies of "The Application of Vat Dyes" at $5.50 per copy.

Name ..... Address.....

.....

.....

1953 NATIONAL CONVENTION

CHICAGO, ILLINOIS • SEPTEMBER 17, 18, 19

Headquarters: Conrad Hilton Hotel

Auspices of Mid-West Section

Photo by Chicago Aerial Survey Co

The Conrad Hilton—1953 Convention Hotel

IDEAL QUARTERS CHOSEN FOR 1953 CONVENTION

A CHICAGO landmark, one of the largest lakefront buildings on Michigan Avenue and the biggest hotel in the world, the Conrad Hilton, has been chosen as headquarters for the 1953 National Convention to be held in Chicago on September 17, 18 and 19 under the auspices of the Mid-West Section.

There are 3000 guest rooms in the hotel and 1000 of them have been set aside for the AATCC Convention with a possibility of obtaining more if needed. Thus, for the first time in several years, all members can be accommodated under one roof.

The building itself has 25 stories, a five-story tower, five basements, and a 14-story connecting service building. The dining rooms in the hotel—Boulevard Room, Oak Grill Room, Park Row, Lakeside Green Cocktail Lounge, Ol' South, and Coffee Shop—can seat 3000 persons.

The hotel was originally opened in 1927 as a luxury establishment under the name of the Stevens, the grand stairway of the center lobby being patterned after the Versailles Palace. In 1942 the Army bought the hotel and turned it into a gigantic barracks, housing 10,000 aviation cadets. After its use by the Army it was purchased by Steve Healy and completely renovated. In 1945 it was purchased by the Hilton Corporation and renamed the Conrad Hilton.

EXHIBIT FACILITIES

THE exhibition hall in the Conrad Hilton is sufficiently large to accommodate 160 booths and it is currently planned to set up 90. Most of the exhibition spaces will be equipped with running water, drainage facilities, etc, and individual telephone service in all, if desired. An important feature of the exhibition will be the fact that all booths are located in one room rather than being located in various rooms on different floors. A special elevator brings fully-loaded ten-ton trucks directly into the exhibition hall. The exhibition area is completely air-conditioned.

THEME OF CONVENTION

THE slogan adopted for this year's Convention is "AMERICAN ACHIEVEMENT TODAY CHALLENGES COMPARISON" and, even in selection of headquarters, the Committee has adhered to this theme.

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Allied Chemical & Dye Corporation
946 Merchandise Mart
Chicago 54, Illinois

Assistant Chairman

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Chicago 18, Illinois

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American Cyanamid Company
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Chicago 18, Illinois

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Chicago 3, Illinois

Hotel

JOSEPH H JONES

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J GORDON STOTT
Ciba Company, Inc
325 West Huron Street
Chicago 10, Illinois

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JACK G KELLEY
E I du Pont de Nemours & Co, Inc
7 South Dearborn Street
Chicago 3, Illinois

Reception

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Rohm & Haas Company
222 North Michigan Avenue
Chicago 1, Illinois

Registration

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National Aniline Division
Allied Chemical & Dye Corporation
946 Merchandise Mart
Chicago 54, Illinois

Technical

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Indianapolis 6, Indiana

Transportation

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820 South Clinton Street
Chicago 7, Illinois

EXHIBIT SPACE AT 1953 CONVENTION

A number of choice exhibit spaces are still available at the Convention. Prompt application for these spaces should be addressed to the Exhibit Chairman:

Samuel Klein
Calco Chemical Division
American Cyanamid Company
3505 N Kimball Avenue
Chicago 18, Illinois

Convention Theme:

"American Achievement Today Challenges Comparison"

1952 Annual Convention——

ANNUAL BANQUET*

AFTER the waiters had withdrawn from the banquet room for the 1952 Annual Convention in the Hotel Statler in Boston on November 8, 1952, the toastmaster for the last event of the affair arose.

Walter J Hamburger: Ladies and gentlemen, any resemblance to Joe Martin is purely coincidental. It is my privilege in commencing the formal activities of the evening to introduce to you the Chairman of our Host Section, the Northern New England Section, C Wendall Lever.

C Wendall Lever: National Officers, Officers of the Northern New England Section, Honored Guests and Members of the American Association of Textile Chemists and Colorists. As Chairman of the Host Section, it is my pleasure to welcome you to the final gathering for the 1952 Annual Convention.

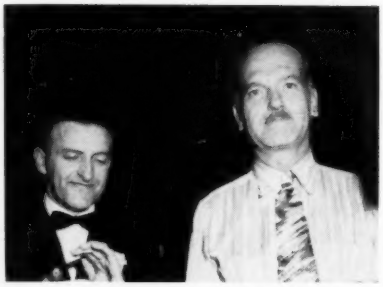
It has been most inspiring to witness the gathering of so many of our members and friends in the common interest of promoting the sciences of textile chemistry, dyeing and finishing. I hope you may add a pleasant memory of this dinner to those from the meetings that have already become history. Again, I bid you welcome.

Toastmaster Hamburger: I now have the pleasure of introducing to you the General Chairman of the 1952 Convention, for whom, as a member of a Convention Committee for the second time, I suggest three cheers for George O Linberg.

General Convention Chairman Linberg: Thank you Walter. First, let me give you a few statistics. There have been 1731 registrations, the second highest number thus far, among whom were 260 of the fair sex, that latter number being a record. There are about a thousand at this banquet alone.

Now I want to name the Honor Guests, and as I name them, will those who are here please stand. Please withhold any applause until all have stood.

We thank you gentlemen for coming here tonight. You will notice that there wasn't a PhD in the crowd.



Dr W George Parks, attired in a resounding shirt of the new synthetics, receives the plaudits of Intersectional Contest Chairman F J O' Neil. Dr Parks represented the first-prize winning Rhode Island Section

I should also like to welcome our visitors from across the water and beyond our borders. You will notice that I do not use the word "foreign", an epithet that should not be used at a gathering like this. These folks are our friends from Canada, England, Switzerland, France, Germany and India. Please give these visitors, many of whom are also members of our Association, a real welcome.

I am the happiest man in this ballroom this evening to be nearly at the end of a year's work on this convention. I want especially to thank the wonderful group of about eighty men and women who have worked so long and hard to make this meeting a success.

Mr Lever was kind enough to appoint me General Chairman of this convention, and I accepted this chairmanship after having served once before in 1946 only because I knew from my previous experience that the eighteen chairmen would do all the work and make it easy for me. You will agree that they have succeeded admirably in making this a very successful affair; most likely no other convention chairman has ever accepted a chairmanship for the second time because he has not had such a wonderful lot of hard workers as we have here in Boston.

Now, I want to talk about a wonderful lady, who knows not that she is the subject before the house at present. I am referring to the wife of one of our conscientious workers in AATCC, a woman who, in addition to being wife and housekeeper, has been a secretary, stenographer, receptionist, and file clerk. For years she has been both a left and right bower for her husband. To show the appreciation of this Association and myself, I have a bouquet for this person, that is, for Mrs Norris Rabold. Fern, please come up and get your flowers.

Toastmaster Hamburger: I should like now to introduce those who are seated at the head table but who are not participating specifically in the program this evening, including the visitors from other countries and our various National Officers and National Committeemen.

We are all anxiously awaiting news about the Intersectional Prize-Paper Contest. I present to you our friend, Frank O'Neil, Chairman of the committee in charge, who will announce the winners.

Frank J O'Neil: I always like to keep you in suspense a while, because I know how you are dying to know the results. For the benefit of those who may not be aware of this, we hold a contest every year at which not all but most of the sections present a technical paper on a textile subject.

The third prize winner is the New York Section; and the second prize winner, the Philadelphia Section. It is difficult to announce the first prize winner, because there has been undue influence in the matter. I should like to have George Parks come forward and exhibit his shirt and tie so that you can understand why. These have been washed six times and yet the color has not run from the bright stripes in either the Orlon shirt or the Dacron tie. The first prize winner is therefore the Rhode Island Section.

George Parks: I should like to assure the ladies that these are the only shirt and necktie of this color styling in the world.

Toastmaster Hamburger: This is one time

* Held at the Hotel Statler in Boston on November 8, 1952.

HONOR GUESTS

G E Sinkinson, President of Sayles Finishing Plants, Inc.
R C Dick, President and Treasurer of Naumkeag Steam Cotton Co.
Henry M Bliss, President of Pacific Mills.
Abbot Stevens, Vice-president of M T Stevens and Sons Co.
Harold S Walker, President, Bachmann Uxbridge Worsted Corp.
Gilbert Verney, President of Verney Corp.
T L Clark, Treasurer of Talbot Mills, Inc.
Frank Bussiere, Manager of Northfield Mills, Inc.
W H Hough, Vice-president of Enterprise Dye Works, Inc.
Richard Olney, Superintendent of Wannalancit Textile Co.
James Stevenson, Vice President of Bradford Dyeing Association
W A Traver, Chairman of the Board for Franklin Process Co.
Raymond Curtis, President of Kenyon Piece Dye Works, Inc.
E Dean Walen, Vice-president of Pacific Mills.
H D Ruhm, Jr, President of Bates Mfg Co.
Oliver Moses, III, President of Worumbo Manufacturing Co.
Elmer C Ward, President of Goodall Sanford, Inc.
Francis W White, President of American Woolen Co.
Tracy A Adams, Textile Industrialist.
Edwin Wilks, Jr, Manager of Slatersville Finishing Co.

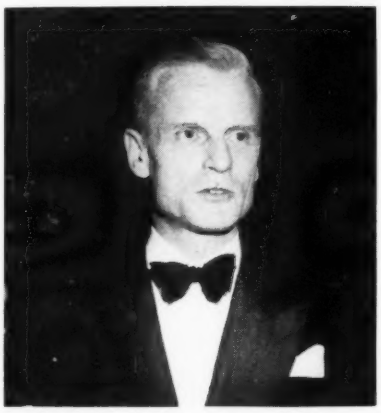
when the press photographers have missed the boat; none of them have color film.

Professor Theel has an announcement to make.

Percival Theel: Through the generosity of the Howes Publishing Company and the efforts of Norman Johnson, Editor of the *American Dyestuff Reporter,* there was established two years ago the American Dyestuff Reporter Award for the best paper published in the *AATCC Proceedings* during the previous year. The first award was made at the last Convention in New York. The Board of Judges for this year, Harold Chase, John Dalton and Professor Ethel L Phelps, reviewed all the papers published in the *Proceedings* from July 1, 1951 to July 1, 1952. They have picked as the winner the one presented before the Rhode Island Section in May of 1951 and published in the issue of Sept 17, 1951, entitled, "High Temperature Dyeing of New Synthetic Fibers". The authors were Charles G Lyle, Joseph T Iannarone, Jr, and Robert J Thomas. Mr Lyle is in the South, but the other two can now receive the award. Gentlemen (to the recipients), I congratulate you.

Toastmaster Hamburger: You recall that George Linberg said we have guests from overseas. One of these is P W Cunliffe, Chairman of the Fastness Co-ordinating Committee of the British Society of Dyers and Colourists, who will speak for the overseas visitors.

P W Cunliffe: Mr Toastmaster, Ladies and Gentlemen. It is always difficult for one from overseas—you notice I don't say "foreigner", although you know that my badge here did say "Foreign", but I crossed that off and put "England" in its place—to



P W Cunliffe, Society of Dyers and Colourists, Extends Greetings

select just the right words to express the meaning intended.

I might, for example, address your President as "Mr President". Our colleagues from France would know him as "Monsieur President", and our colleagues from Germany would know him as "Herr Praesident". However, I have decided, after being here four days, that the appropriate word is "Norris".

On the other side of me is a gentleman whom I shall address as "My dear George". And I hope you will understand my words, for I speak American with an English accent!

However, I do bring greetings from the society of Dyers and Colourists to all members of your Association.

The joint work on the *Colour Index,* which is well known to all of you, has brought our two societies very close together, and, when you work with men you certainly know them better.

For myself, my major interest is in fastness tests, and the English and the American Standards Associations hold the joint secretariat for the Fastness Committee of the International Standards Organization, which meets in New York next week.

I should like to pay my personal regards and thanks to your president, Norris Rabold, for the kindnesses that we have received. I should also like to express the thanks of the representatives of France, Germany and Switzerland, who have asked me to speak on their behalf.

Apart from the fastness work, which, in a way, is a side line, I want to be personal for a moment and tell you that my own job is research. So; it was rather natural when I came over here on Tuesday, to have my mind still on research and to want to investigate your political system. This was an obvious subject, and I therefore set myself the problem of finding an avowed Democrat.

I was somewhat shaken, when the election results were announced, that I hadn't found one; but, like a good chemist, I persevered. I had almost given up, but late last night, a member and his wife confessed to this unusual way of thinking. And they also confessed that the bottle of wine, which we were enjoying, was not the first of the evening for them.

Now, I think that all good chemists could learn from this convention that the main factors in any situation are time, temperature and concentration. What more, than to carry out the analysis of all this! I think it was significant that the *time* was past midnight, the *temperature* in the room was excessive, and the *concentration* was as high as the law permits. At this stage I dropped my inquiry, because I felt reasonably satisfied.

Well, I now have a very pleasant duty to perform, which is to present to the American Association of Textile Chemists and Colourists a copy of a book that was produced by the Society of Dyers and Colourists. This is a specially bound book with a printed introduction; it is a copy of the proceedings of our last Symposium on Tinctorial Arts, that is, a meeting on dyeing.

It is my pleasure, Mr President, to present to you, on behalf of the Society of Dyers and Colourists, this volume, which I trust you will find useful in your Library.

President Norris Rabold: Perry, I wish to thank you personally on behalf of the American Association of Textile Chemists and Colorists for this gracious gift from your Society brought here by you, whom I count as an old good friend.

Toastmaster Hamburger: At this time I should like to present to you a man whom you have already heard about and seen, our President, Norris Rabold.

Prof Percival Theel (left) presenting the AMERICAN DYESTUFF REPORTER AWARD to J J Iannarone (center) and R J Thomas

PRESIDENT'S ADDRESS

C NORRIS RABOLD

LADIES and Gentlemen: I have a few prepared words here, and I was going to read them to you; but, I find that some things have happened during this convention that make me want to change from the words I had prepared, which I shall do, with your permission.

First of all, it has been customary, during an annual meeting of this sort, for the President to convene a business meeting. We did so in Portsmouth, and it seemed to me that, at the business meeting in Portsmouth, there were in attendance two very sterling characters, members of long standing, and there were some individuals who came in under the misapprehension that they could go to sleep, and they did, and there was a photographer present, as well as your President, of course. Well, now, I felt that that was rather wrong, because I was busy dodging the photographer. He would say to me:

"You stand on this side." I did, and I tripped over a cord. He then said:

"You stand over here and open your mouth."

I did. Then: "Close your mouth." And that was a sensible suggestion, with which I complied.

I wound up, frankly, with no pictures, no audience, and the business report was not heard by anybody.

And so I have been mulling that over in my mind, and I decided that if I were going to have a business meeting, by golly, I'd have an audience.

The business meeting will now come to order!

Don't worry; some of the things that I had for the business meeting are things that I had planned to say, here.

Also, some years ago, somebody in the Piedmont Section, to which I belong, inadvertently, or accidentally, I am sure, regretfully invited me to make a few remarks at a meeting. Well, I got rather confused about the remarks, and what I should say. However, I went to the meeting in a state of confusion. I got there, and one of our friends tried to be helpful, and he sort of calmed me down.

Then he said to me: "What are you going to talk about?"

I said: "I will talk about twenty minutes."

My friend looked at me, thoughtfully, and he said:

"That's a good subject, but it's a little long, don't you think?"

And so the business meeting will proceed along those lines.

I shall now do something, Perry, that some speakers do when they prepare a speech ahead of time. They either quote from the speech, read excerpts from it, comment upon it, throw rocks at it, or whatever they decide to do at the time, and I think that that is a lovely way of presenting a talk, rather than reading it from a paper.

I do have a few words that I should like to read, and then if you will pardon me, I have some excerpts, too, that I shall give you.

In regard to our business meeting, I should like to comment upon our Publicity Committee. First of all, chemists are rather reticent individuals; generally speaking, a lot of us take for granted the things we do, and the things that we know. We don't advertise ourselves very well. But, our Publicity Committee has done an excellent job of informing both our members and the public in general as to what we are doing.

This Committee has really performed an outstanding job for us. But, they are few in number. And, I feel that each one of you could help the Publicity Committee through your own efforts. Each one of you could be an individual Publicity Chairman, talking about the Association to your friends and fellow workers, and giving them a better understanding as to our aims, objectives and performances.

In order to do this, however, each member must know what we are doing.

First of all, I want to say a few words regarding the matter of publication.

The Publications Committee has done an excellent job during the past year. And there are two things that we publish, regularly; they are things that I fear we do not really look at as thoroughly as we should. I refer, first of all, to the *Proceedings* that appear in the *American Dyestuff Reporter*, issued every two weeks. These Proceedings provide a source for the latest technical information, a means through which any research project, new chemical, or process, or any development of interest, can be discussed by the author and presented to you.

Maybe the members do not read the *Proceedings* as much as they should. Surprisingly, I find that they do not. People ask me questions, and I say to them: "Look in the *American Dyestuff Reporter*." And there it is.

Another item that we publish and too often take for granted is our *Technical Manual and Year Book*. This book contains a terrific amount of information. I won't go into detail about that, but look at your *Year Book* and its many different sections. I ask those of you who do not have occasion to use it every day to look at those sections and to give us any constructive criticism you may have to offer. The Editor, I know, will be very much pleased, as will be the Publications Committee, to hear from you, because, within those two covers of the *Year Book*, there is probably more information regarding dyes, chemicals, and test methods than you can find in any one source in the United States.

There will shortly appear in print three volumes on specialized subjects, which we feel will be helpful and useful to every dyer and chemist. The first of these is a book on dyehouse mathematics. The Publications Committee has long felt there is a need for a handbook of this sort in which mathematical problems that arise every day in the dyehouse and color shop are explained in simple language. How to figure dyeing and printing formulas, finishing formulas, how to make color additions, how to cut and adjust formulas, and similar problems will be explained. This book is intended primarily for the nontechnically trained person, but we think it will also be very helpful to those who have had more advanced education.

The first issue of *Analytical Methods* has been undergoing revision. A new edition of this work in amplified form and with many new analytical procedures will shortly be made available. This book is a "must" for every laboratory.

The Vat Monograph, a very comprehensive treatise covering every phase of vat-color application in dyeing and printing, written by leading authorities in this country on this subject, is now in the hands of the printer.

Of course, everyone knows of the tremendous task we have undertaken in co-operation with the Society of Dyers and Colourists in preparing a new *Colour Index*. This work will be ready for world-wide distribution in 1955.

I should like to refer also to the work of our General Research Committee. Some years ago the Association took stock of its research work and decided that it certainly could not engage in every phase of research concerned with the application of color to fibers and fabrics. Much of our research work had to do with the development of "yardsticks", in other words, the development of test methods for the evaluation of the fastness of dyes on fibers. It was decided that our research efforts be confined primarily to the further development, improvement and refinement of tests of this sort. It was also decided, and most wisely, that arbitrary tests in which distinctions could be drawn between one dye and another were not sufficient in themselves and that our whole testing program be reviewed with the object of developing tests that would be of ultimate value to the consumer. These tests should of necessity duplicate or correlate closely with actual use conditions and be designed to evaluate the properties of fabrics and dyes in terms of consumer use. This meant a complete revamping of many tests.

Currently, we have some 25 or more research subcommittees, made up of scores of

chemists engaged in this type of research. One might say, when a test is set up, "That is it, there is no need for any further work, and this research can now be abandoned." Unfortunately, such a condition does not exist. We are constantly developing new fibers, new dyes, new chemical finishes, and new end uses for fabrics. Thus, some of our committees are busy keeping up with changing requirements. The ideal that the Research Committee aims at is to have test methods ready and waiting when the occasion arises. One can readily see the infinite amount of work that needs to be painstakingly and carefully done in order that we may be assured of reliable methods for the evaluation of our fabrics, dyes and finishes. Presently, we are engaged, with our many distinguished friends from England and the continent, in attempting to establish tests that will have world-wide application and acceptance. I assure you this phase of research activity has kept many of us very busy indeed. We meet Monday in New York under the auspices of the International Standards Organization and the hospitality of the American Standards Association to make progress in adopting international testing methods.

We have two general classes of membership in the AATCC: individual and Corporate. Our individual membership has more than doubled itself in the past decade, so that we now number some 7,000. Dues received from these members go into the general operating fund and make possible the organization and operation of both the national body as well as the local sections. Our corporate membership has increased in the past ten years also, but not at the rapid rate of individual membership. Corporate-membership dues are earmarked for the use of the Research Committee, to be spent on the maintenance of our permanent research organization and on special projects selected by the Executive Committee on Research. I think it is obvious from what has been said regarding the work of the Research Committee that it is imperative that this work be expanded since it is so fundamental to the industry itself. All I need to say on this subject is "Think what a chaotic condition indeed there would be in the wet processing of textiles if we did not speak a common language and have test methods understood and accepted by all concerned."

As times change and as our numbers and problems increase, so do administrative details become greater in number and complexity. I have tried to delegate authority to the committees of the Council responsible for various duties, and I want to thank wholeheartedly the chairmen of each committee, as well as the members, for the way they have responded to their responsibilities. We are currently working to strengthen the permanent national organization so that many details can be taken off the shoulders of the elected national officers.

I wish now to say just a word to our President-elect, as well as to each one of you. This Association was founded upon a spirit of co-operation and mutual friendship. This spirit exists today. Without it, our Association would not mean very much to any one of us. We must carefully guard this spirit; we must maintain and encourage participation by our members in the work we are doing; we must beware of various pressures that can arise from time to time, for some of these pressures could easily turn us away from the original aims and objectives as laid down by our founders. Bear in mind the young man, the boy starting off in the laboratory, print shop, or dyehouse. He is as much a member of this Association as any one of us who have been members for many years, and he is entitled to the same rights and consideration.

We are a truly democratic group, comprised of sections all over the United States, each with their own ideas and ideals. It is from the different views, needs and wishes of our scattered members and their right freely to express their thoughts that this Association has become what it is today.

Continue to foster the spirit that today prevails throughout the Association. As long as this spirit exists, our future is assured.

In closing, I should like to say, George, that you did a most gracious thing tonight, and, on behalf of my wife, I want to thank you very much for the beautiful bouquet.

I should also like to thank the officers of the Association, the Committee members, who have worked so closely with me, and all of you, for your participation in our endeavors.

* * * *

Past President Henry F Herrmann (right) Congratulates President C Norris Rabold

C Wendall Lever (left), Northern New England Section Chairman, presents George O Linberg an engraved clock in appreciation of his service as Chairman of both the 1946 and 1952 Conventions.

Toastmaster Hamburger: Henry Herrmann now has a word to say.

Henry Herrmann: I didn't know that I was going to say anything to the public, but I do have a few words to say to Norris Rabold. The fact that the microphones are open to the public is only coincidental.

Norris, you inherited the Association, and now you are about to pass it on to a successor. Those of us who love the Association are proud of what you have done for it. Under you the Association has grown astonishingly, but numbers alone are not too significant. It is the leadership that you have given in maintaining the fine spirit of our organization that is important. You who are here at this meeting must have sensed that bigger and better things are ahead for us as this spirit carries on.

I am inspired too by the friendship exhibited here by our visitors from abroad, and the interest they show in our work.

Of course, you understand, Norris, I am talking only to you.

Some day you are going to be followed. You are about to become yourself a Past President. I don't know why they call you "Past" President, for "Past" makes it sound as though you were all done.

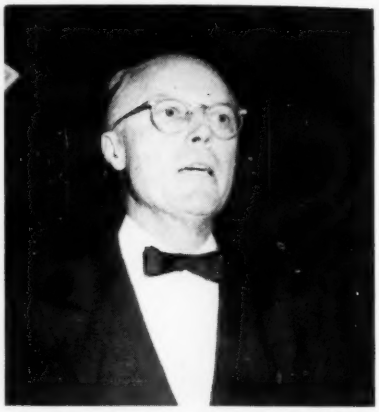
In our *Year Book*, we have a picture of the active President, and then down below him, we have the Past Presidents. The last one in the *Year Book* is named Henry Herrmann, 1947-1949. And so, there will be added in the next *Year Book* the name of C Norris Rabold, 1950-1952. And you know, Norris, that is going to stay there as long as they publish this book. And it may be for one hundred or five hundred years that you will be there. And then the gentleman who will succeed you will be down there, too.

I have had this position of that President for three years, and I have not minded it, and I am proud now to have you there, and I am proud to have William D Appel above me. And I hope that you will be with us over the years that are to follow.

I want to leave with you this picture. This page in the book here and these other pages will change as time goes on; but this little group stays put. This is a real accomplishment. I am sorry if I have seemed to create any impression of conceit, because that is the last thing that I want to do. I merely wish to honor you, Norris, in association with those men who will go down in the history of this Association, as its founders.

Right now, you are No. 11, and I am proud to be in that group with you. I am proud for your successor. I am proud for all of these people who are contributing this thing to our Association.

As you take your place, you cannot go unidentified or undecorated. (Past-President Herrmann then pinned the Past-President's badge on the lapel of President Rabold's coat.)



William H Ruffin, President, Erwin Mills, Inc, Guest Speaker

And now, you are truly prepared. But, remember, it will be January 1st before you can properly wear that pin.

And so, folks, may I ask you to rise and give our President a big hand! (Applause)

* * * *

Toastmaster Hamburger: Our speaker of the evening, William H Ruffin, holds a Bachelor of Science degree in Commerce, receiving it in 1921, at North Carolina. He started his business career in overalls. His first job was on the loom, and from then on, for a period of two years, he apprenticed in various phases of the mechanical aspect of the technical industry.

He entered the administrative phase in 1923, and has held successively positions as Assistant to the Secretary and Treasurer, Secretary, and Assistant Treasurer, Vice-President and Treasurer, and presently, President and Treasurer of Erwin Mills, Inc, where he has spent his entire professional career.

Mr Ruffin came up the hard way and stayed put.

He is a Director in many corporations, and he is a Past President of the North Carolina Industrial Council, the North Carolina Cotton Manufacturers' Association, the University of North Carolina Alumni Association, and the Durham Rotary Club.

He is active in Church affairs, and is a member of the Kappa Sigma Fraternity.

In 1951, Mr Ruffin was elected President of the National Association of Manufacturers, and as such, he has the distinction of being the first member of the textile industry to be elected to this post. He presently is Chairman of the Board of the National Association of Manufacturers, and his popularity is obviously attested to by the outstanding representation of captains of the textile industry present here tonight!

It gives me great pleasure to present to you William H Ruffin, President and Treasurer of Erwin Mills, Inc, of Durham, North Carolina! (Applause)

William H Ruffin: Mr Toastmaster, Mr President, Members, Friends and Guests of the Association. It is a great pleasure and a very real privilege to speak to this distinguished group of textile scientists and guests.

While representing, during the past two years, the National Association of Manufacturers, the press would often ask me questions like this:

"Is not the National Association of Manufacturers nonpartisan, politically?"

"Yes, of course," I would answer.

"Well, wasn't that a partisan speech you just made?"

"No," I would say, "those statements are matters of principle."

I did not always get full acceptance of that, but anyway, on this Saturday evening following the elections on Tuesday, I am sure you will consider it appropriate for me to refer to some of the important principles involved in the elections.

(Mr Ruffin then delivered a speech that was most inspiring for those who were still celebrating the Eisenhower presidential victory. Since his words did not directly concern textile or AATCC affairs but rather the political welfare of the country, they are not repeated here).

* * * *

Toastmaster Hamburger: We have only a word or two before we rap the gavel for the last time on the 1952 AATCC Convention. C Wendall Lever now has a few words for you.

C Wendall Lever: The sands of time are fast running out, carrying the 1952 Convention into pleasant memories.

Back of all the carefully planned events of this Convention was a helmsman who chose to steer a well-charted course. He has maintained a happy ship throughout the voyage and has most successfully brought the ship to port.

Friends, as retiring Chairman of the Northern New England Section, I wish now to present to you, George Linberg, on behalf of your colleagues, this token of our appreciation of a job well done, not only this time, but also previously in 1946. We recognize in you those attributes so recently voiced by the Olney Medalist: devotion, energy, and enthusiasm. You will readily understand the symbolism of this token in the successful berthing of your ship. (Mr Lever then presented George Linberg with a beautiful ship's clock).

Toastmaster Hamburger: Thank you, Wendall, and thank you Gentlemen of the Committee.

General Chairman Linberg: Thank you, Wendall, and thank you, fellow committeemen. We now come to the close of the 1952 Convention. Good night, everyone, and may we all meet again at the next AATCC Convention in Chicago on Sept 17, 1953. This Convention now stands closed.

Northern New England Section——

THE CHEMISTRY OF DIAMMONIUM PHOSPHATE*

WILLIAM B COLEMAN
Applications Research Unit
Victor Chemical Works
Chicago Heights, Ill.

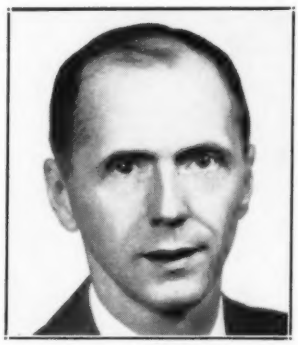
INTRODUCTION

THE "Chemistry of Diammonium Phosphate" is a more appropriate subject than it would at first seem, to present before the Northern New England Section of the AATCC, when one considers that, in reality, it treats a particular phase of wool piece dyeing. The problems which attend the dyeing of wool piece goods result, in large part, from the number of variables that exist in the process and that are difficult to control in practice. The significance of diammonium phosphate as an assistant in the elimination of uncertainties and as a positive aid in control of the dyebath will be developed from an examination of its principal properties.

DISCUSSION

A brief description of diammonium phosphate will serve to introduce it to those who are unfamiliar with the chemical. It is a white, crystalline material, mildly alkaline in reaction, noninjurious to handle, and readily soluble in water. It is represented by the chemical formula $(NH_4)_2HPO_4$ and is called, besides diammonium phosphate, ammonium phosphate dibasic, or secondary, and diammonium monohydrogen phosphate. For the sake of brevity, however, it is usually called DAP. There are other uses for DAP, incidentally,

*Presented at the Annual Meeting of the Northern New England Section at the Lowell Textile Institute, Lowell, Mass, on Dec 5, 1952.



W B COLEMAN

Diammonium phosphate (DAM) is claimed to be ideal as a dyeing assistant for wool in all forms in the application of acid and chrome dyes—especially neutral-dyeing acid colors. It is shown that such well-penetrated and level results are to be expected because of the strong buffering properties of this salt and its power to develop acidity slowly and gradually upon boiling. These properties are explained and illustrated.

than as a dyeing assistant. It is used in bread improvers, as a cataylst for urea-formaldehyde resins, as a flame retardant for paper, fabrics, and building materials, and as an ingredient of highly concentrated, water-soluble plant foods.

Three properties make DAP especially suitable for a dyebath assistant: it exerts what may be called a preconditioning effect upon cloth, it possesses strong buffering power, and it produces acidity gradually when heated in solution.

PRECONDITIONING CLOTH——The importance of having cloth at the proper pH before dyeing proceeds is well recognized. At this stage the cloth should be slightly alkaline. The correct pH, along with high temperature of the bath as the boiling point is approached, induces swelling of the wool fiber, an increased rate of dye diffusion, and a decreased affinity of the dye for the wool. That these conditions should prevail at the outset is essential; hence the need for a preconditioning agent. The situation that often exists in practice is that the cloth contains residual amounts of acetic acid from continuous scouring, or alkali from some other prior treatment. Unless the exact circumstances can be measured and controlled at the beginning, nothing resembling uniformity of procedure can be expected.

It is at this stage that DAP exhibits a preconditioning effect. Introduced into the bath in the same manner as any other constituent, it brings the cloth to a pH suitable for dyeing, namely, to a pH between 7 and 8, depending somewhat on the particular conditions prevailing.

The point can be demonstrated in the laboratory by immersing a piece of wool cloth in a 1% solution of soda ash or in a 3% solution of acetic acid for one hour to thoroughly penetrate the material. The cloth may then be passed through wringer rolls and immersed in fresh water for ½ hour to leach out the acidity or alkalinity. The fresh water rinse may be repeated, the cloth wrung dry, and a sample of it may be cut into shreds and placed in a Waring Blender or similar pulping device with a little water. The remains of the cloth may be tested with a pH meter, then, and the one having received the soda ash treatment will show a pH value of 9.1 or thereabouts. the acid sample, about 4.6. Neither would be suitable for dyeing, although both pieces were rinsed. If, after the water rinses, samples of each cloth were treated with a 2% diammonium phosphate solution, they would each show subsequent pH's of 7.9 or close to this figure. This behavior makes

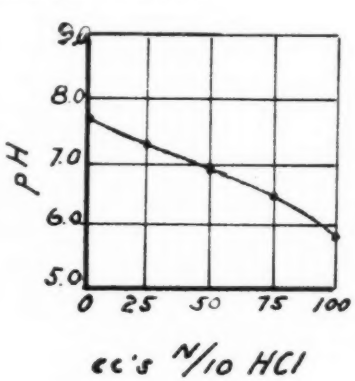


Figure 1
Buffering Power of Diammonium Phosphate

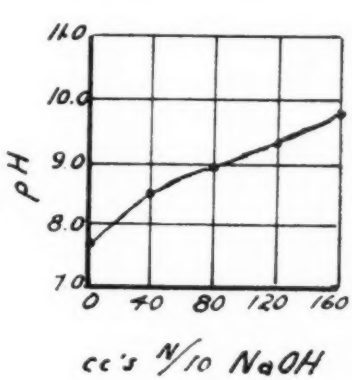


Figure 2
Buffering Power of Diammonium Phosphate

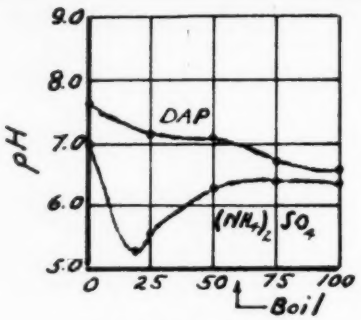


Figure 3
Experimental Dyeing

preconditioning a very important step in the dyeing process; it results from the buffering power of DAP.

BUFFERING POWER —— A buffered solution is one that does not change pH greatly when a strong acid or a strong base is added to it. Experimental data make clear the stabilizing effect that DAP has on a dyebath. If 100 cc of a 1% solution of DAP be titrated with a 0.1 N solution of hydrochloric acid, the gradual change of pH that occurs is shown by Figure 1. Figure 2 shows the pH change when 0.1 N sodium hydroxide solution is added to 100 cc of a 1% solution of diammonium phosphate. A practical example of the buffering power of DAP may be seen in Figure 3, which shows a series of pH values taken on the bath at intervals in an experimental dyeing on carbonized wool. The two lines represent dyebaths of identical composition, except for the dyeing assistant, which was ammonium sulfate in one case and DAP in the other.

PRODUCTION OF ACIDITY——Up to this point, attention has been directed to the importance of proper pH at the outset of dyeing. It becomes necessary, as dyeing proceeds, to bring about exhaustion of the dyestuff in a controlled manner. This DAP assists in doing by a gradual liberation of acid. The increase in acidity results from a thermal decomposition in which ammonia is lost and in which the diammonium phosphate is converted in part to the more acidic monoammonium phosphate. The over-all pH change is from 7.8 at the start of dyeing to about 5.8, after which a further decrease in pH may be achieved by addition of other exhausting agents. DAP is not the only assistant that will produce acid in this way. Ammonium sulfate and ammonium acetate show the same general behavior, but a consideration of Figure 4 shows that they do not establish a starting pH in the alkaline range, and produce acid too soon in the process. Such conditions would tend toward less dye penetration and less levelness.

CONCLUSION

The use of diammonium phosphate as an assistant in dyeing wool with chrome and neutral types of dyes is based on a preconditioning effect upon the cloth, a strong buffering capacity of the chemical, and the property of gradually decomposing to liberate acid. A favorable starting pH is assured, which, followed by a gradual increase in acidity, keeps the bath under control at all times, permitting diffusion of dyestuff, and uniform exhaustion. Experimental evidence shows that the inherent properties of diamonium phosphate are such as to make it a definite aid in promoting level dyeing by removing variables resulting from inconsistencies in pH.

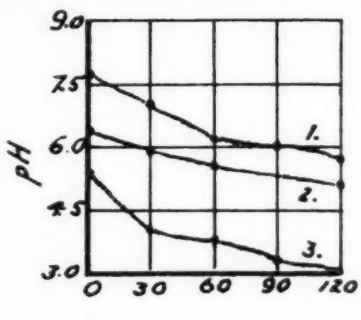


Figure 4
Decomposition Curves
1) Diammonium phosphate
2) Ammonium acetate
3) Ammonium sulfate

Northern New England Section——

DIAMMONIUM PHOSPHATE IN WOOL DYEING*

JOHN N DALTON
Director, Chemical Research Department, Pacific Mills, Lawrence, Mass.

INTRODUCTION

IT may seem strange to talk about wool dyeing today when there is so much interest and so much research in the methods of dyeing the new synthetic fibers. Comparatively speaking, wool is a very easy fiber to dye and may appear to present no problem, particularly when compared with the difficulty of dyeing "Orlon," "Dacron," and other high polymeric fibers with colors of satisfactory fastness. Paradoxically, it is the ease with which wool dyes that has always presented a problem. In other words, where you have to force color into the new synthetics by pressure, heat, organic swelling agents and metal complexes with variations, wool attracts dyes so readily in aqueous solutions that its dyeing has to be controlled to obtain a desired result.

Diammonium phosphate produces a dyeing process with a self-controlling pH range in the usual mechanical processes of wool dyeing that provides

1) **The use of a wide range of dyes for wool of excellent fastness properties, but which have been extremely difficult to dye level.**
2) **A method of dyeing that is highly reproducible.**
3) **Thorough penetration in the fabric of these fast dyes with elimination of warp streakiness and irregularities due to fabric mending.**

These advantages are brought about by a slowing of the rate of fixation of dye on the fiber, while colloidal dye aggregates in the bath break down into a monomolecular condition and thereby increase the diffusion of the smaller dye particles into the wool fiber as the latter is swollen to the maximum extent to allow such dye-particle diffusion.

DYEING PROPERTIES OF WOOL—— Characteristics of the wool fiber that promote ease of dyeing are its ability to swell in hot water, which can be increased by acids, alkalis and by increase of temperature. Also, the chemical configuration of the wool polymer is a most important factor in attracting color to the fiber. Wool is a natural polymer synthesized by the metabolic process in the normal growth of the

* Presented at the Annual Meeting of the Northern New England Section at the Lowell Textile Institute, Lowell, Mass on December 5, 1952.

sheep animal. As is true with all natural products, the physical structure, although viewed in perspective appears to have beautiful symmetry, in detail it has many variations. Nature may have a very definite plan in producing such a structure in the process of evolution and environment adaptation. Unlike the synthetic high-polymer fibers, which can be considered as long linear chains in almost perfect orientation whose micelles are quite crystalline aggregates of powerful attractive forces, such as hydrogen bonding and molecular Van de Waal's forces, wool is made up of a mixture of micelles of crystallites (closely packed keratin chains) and a random series of multidirectional molecular chains called an amorphous portion. As this amorphous portion is not held together by too powerful forces, hot water has sufficient concentration of hydroxyl ions to break the hydrogen bonds and to penetrate throughout the mass with consequent absorption by the fiber. The swelling that results can be proportionally increased by both acid and alkali. Both of the latter can also break the salt linkages that bind the crystallite portions to produce increased swelling.

The *chemical* character of the fiber that also promotes dyeing is its amphoteric nature. It possesses both basic and acidic groups in its structure and can therefore combine with both acids and bases. It can be dyed from solutions of dyes with a pH of 1 to 10. Practically all types of dyes will dye wool to a certain degree and with varying degrees of desirability. The problem is to dye it evenly and with as little deterioration of the fiber as possible.

As wool can be so easily dyed without control, it is relevant that we carefully select dyes and methods of dyeing to produce satisfactory results. In considering such an objective, we judge a mass of wool fibers to be acceptably colored whether in the loose state or made into yarn and woven into cloth if the mass is thoroughly penetrated and homogeneously colored

JOHN N DALTON

throughout. This is especially necessary in piece dyeing, where there is no subsequent mixing of fiber or yarn to even up the result.

There are two important properties of wool dyes that have to be carefully considered in dyeing wool in any form thoroughly (with penetration) and homogeneously (with evenness). These properties are the affinity of the dye for the fiber and its rate of diffusion into the fiber.

PROPERTIES OF WOOL DYES——A few words about the chemical and molecular characteristics of conventional wool dyes may be of interest. When a dye, which is usually a sodium salt, dissolves in water, it forms a true molecular solution with the usual ionization of such solutions, or it forms colloidal solutions with varying sizes of aggregated disc molecules.

Dyes of molecular or ionizable types have very low affinity for the wool fiber in neutral solution and require acid to promote the deposition of the dye on the fiber. As fiber swelling is increased by acid and high temperatures, the pore size in the wool fiber is thereby increased and molecular dye particles can diffuse more easily into the fiber. Generally speaking, most wool dyes requiring acid can be grouped into two classes: those requiring a strong acid, such as sulfuric with a high dissociation constant or hydrogen ion concentration, and those that do not require a strong acid and to dye level are dyed with a relatively weak acid like acetic. The highly dissociated acid dyes are the most level dyes there are for wool, but require strong acid, time and high temperature to promote a final level result. The mechanism of dyeing wool with these low-affinity acid dyes involves a *dynamic* equilibrium between the acid-combining amino groups in the wool fiber and the sulfate anion and the dye-acid anion. The function of sodium sulfate in such dyeing plays an important role in slowly exhausting the dye anion from the dyebath to satisfy an ionic equilibrium with the wool fiber where time and temperature are important. Theories explaining acid wool dyeing have been propounded by both Donnan and also Gilbert and Rideal. These theories do not quite agree, but the basis of both explanations rests on a dynamic ionic equilibrium with the ions diffusing through the wool.

Passing from the low-affinity, or level-dyeing, acid dyes to those of high affinity such as the acetic acid dyes, methods of dyeing have to be necessarily changed. We are no longer dealing with highly ionized dyed solutions, but with those of low ionization like a weak acid. To exhaust such dyes with satisfactorily level results, some hydrogen ions are necessary to break the wool salt linkages to provide some dye acid, or dye anion, combination, but much less than with an acid of high dissociation so that the dyeing rate may be considerably slowed down. The combination of acetic acid with wool is like the salt of a weak acid whose ionization tends to depress the ionization of the acetic acid in the dyebath and thereby to slow the dyeing rate.

With a strong acid like sulfuric, the wool fiber becomes positively charged to such a high degree that if the strong acid is used with acetic-acid dyes of high affin-

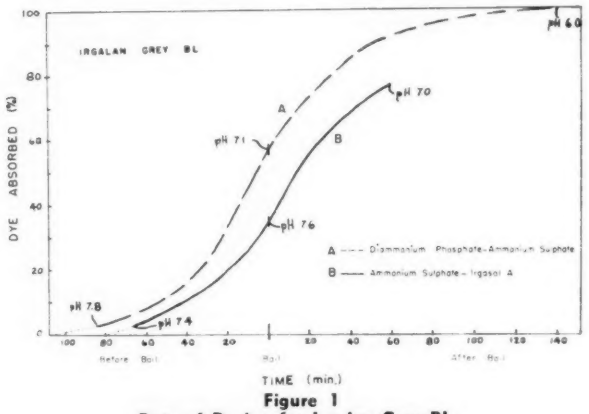


Figure 1
Rate of Dyeing for Irgalan Grey BL

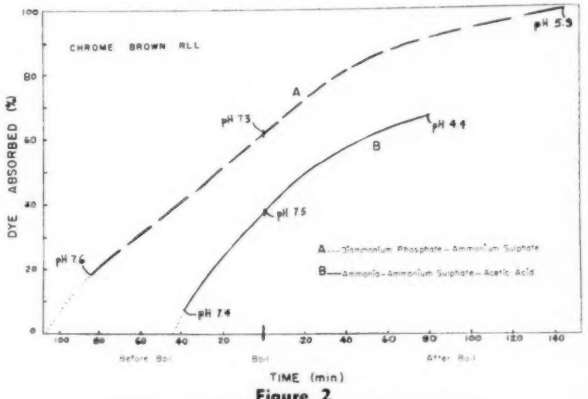


Figure 2
Rate of Dyeing for Chrome Brown RLL

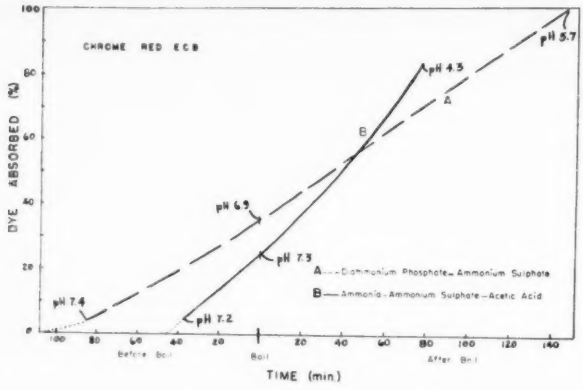


Figure 3
Rate of Dyeing for Chrome Red ECB

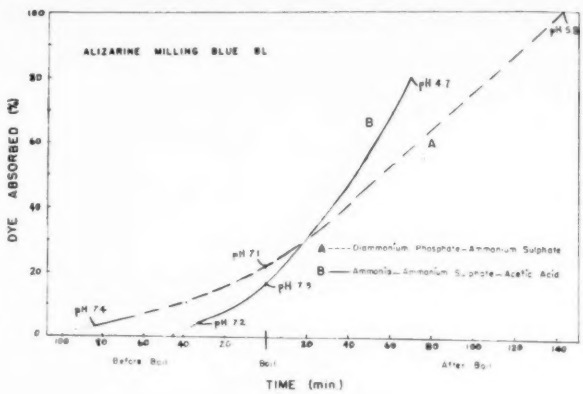


Figure 4
Rate of Dyeing for Alizarine Milling Blue BL

ity, which exist in a partially colloidal state with a negative charge, combination with the wool is so rapid that very uneven dyeing results are obtained.

The next group of wool dyes to consider are the very fast neutral dyes, or those with anions of very high affinity. It is with this group of dyes that we are particularly concerned in using diammonium phosphate to promote level dyeing. These dyes have very good fastness to wet treatments and in many cases possess the best light fastness of wool dyes.

These neutral dyes are of low solubility and form colloidal solutions, that is, the dye particles are dispersed in water rather than being in true solution like the level-dyeing acid dyes. These dye particles in water consist of highly aggregated molecules and acquire a high electrostatic charge from the high concentration of colloidal negative anions. At low temperatures these dyes, because of large particle size, diffuse into the wool very slowly, as rate of diffusion is inversely proportional to particle size. But since the electrostatic attraction of the positively charged wool fiber for these negative anions in aqueous solutions is very great, the affinity of the dyes for the fiber is very high with very uneven distribution of the dye *on* or *in* the fiber. In other words, these dyes level very poorly under their own dyeing conditions without some sort of control.

REQUIREMENTS FOR LEVEL DYEING——Diammonium phosphate provides a means for controlling the rate at which the high-affinity dyes may combine with the fiber. There are three factors which are necessary to accomplish this ideal as follows:

1) High temperature, usually at the boil well above the critical temperature of the dye, which is that temperature in aqueous solution at which the dye exhibits maximum exhaustion.

2) Maximum swelling of the fiber, and

3) Control of the pH of the dyebath.

The high temperature of a boiling dyebath promotes deaggregation of the colloidal dye particles, breaks them down so that their particle size is practically molecular and hence small enough to diffuse into the pores of the fiber; maximum swelling provides plenty of open pores for the diffusion of the dye particles and, last but by no means least, a control of the rate of deposition of dye by means of pH control.

EXPERIMENTAL MILL RESULTS

CONTROL OF pH——Control of pH in dyeing is very nicely obtained by the us of diammonium phosphate, which gradually breaks down when its solution is subjected to high temperature, the extent of breakdown being reflected by a change in pH from 7.85 to 5.78 in 1½ hours. With its high initial pH well above the isoelectric point of wool (4.5), this assistant provides additional negative phosphate ions to neutralize some of the positive electrostatic forces on the wool fiber. While it is so functioning, the dye aggregation is decreasing as the temperature is increased and the rate of diffusion is increased as more available sites for adsorption are provided through the increased swelling of the fiber. Because of the slow rate of decomposition of diammonium phosphate with slowly decreasing pH, the rate of dyeing and diffusion is well controlled while the dyeing operation is continued at as near the boiling point as possible.

The decomposition of diammonium phosphate is so gradual that it is most efficient in preventing the too rapid diffusion of the dye *on* the fiber. In order to exhaust the dyebath in the case of some dyes, however, it is sometimes necessary to add, toward the end of the dyeing, an acid reagent to increase the rate of dyeing. This can be accomplished by the use of an ammonium salt like ammonium sulfate. It is well to note that, by the time this acid salt is used, the dyestuff is in its finest state of dispersion, the wool is most receptive to the diffusion of the fine dyestuff particles within the fiber and level dyeing is not impaired.

PRACTICAL HINTS IN USE——In the use of diammonium phosphate in practical mill dyeing, the following hints are of interest:

1. Before the dyeing operation begins, the cloth from the wet finishing should be wet out with a solution of diammonium phosphate. This procedure is necessary to neutralize any acid or alkali present in the cloth before dyeing. The length of time and temperature necessary will depend on the choice of dyeing method, whether neutral, chromate, or chrome mordant and on the wet-finishing procedure.

2. The time of bringing the cloth to the boil is important and varies with the weight of the fabric from 1½ hours for a 7.5-oz fabric to two hours for a 14-oz fabric. Our aim is to slow down the dyeing rate while maximum swelling and deaggregation of the dyes take place in order to obtain maximum penetration and level dyeing from slow dye diffusion *into* the fiber not *on* it.

3. In washing off dyed goods, 1% acetic acid (56%) on weight of fiber in the wash water is necessary to prevent bacterial growth on the goods when the cloth is allowed to stand wet for a few hours before drying. Diammonium phosphate is an excellent nutrient for all the lower organisms and this must be eliminated by an acid wash.

4. Dyebath ratios are not critical and can vary from 1:12 to 1:20.

5. Diammonium phosphate is also useful in both slubbing and yarn dyeing.

6. It is also advantageous in wool-nylon piece dyeing.

RATE-OF-DYEING CURVES —— In

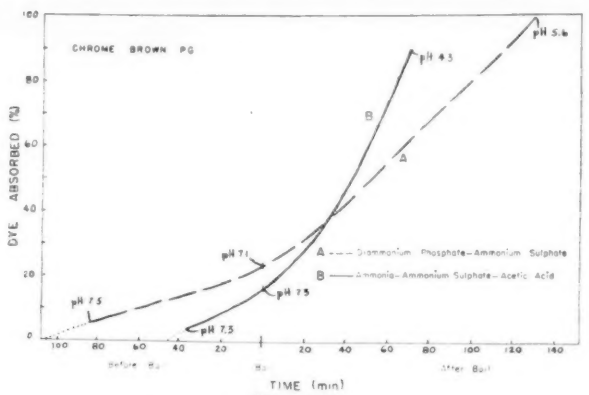


Figure 5
Rate of Dyeing for Chrome Brown PG

Figures 1 to 5 are shown rate-of-dyeing curves for 5 dyestuffs of high affinity by two dyeing methods, A and B, for each dye. These curves show the percent of total dye absorbed from the dyebath by a wool fabric as calculated from measurements of dye left in solution determined with a G E Spectrophotometer as the time of the dyeing proceeds from the beginning to the end of a dyeing cycle. The pH values of each dyebath at the beginning, at the end and at an intermediate point in dyeing are shown alongside each A and B curve.

The A curve for each dyestuff was obtained for a dyeing carried out on wool fabric with diammonium phosphate according to the following method where all quantities are given on weight of fiber:

pH of cloth before start of dyeing 7.5
5% diammonium phosphate (DAP), boil 20 minutes and wash.
5% DAP, run at room temperature for 20 minutes and add
2% dyestuff,
1% sodium bichromate, and
0.5% highly sulfonated castor oil.
Raise temperature to the boil in 1¾ hours, boil 1 hour and exhaust with
4% ammonium sulfate divided into additions of 1%, 1%, and 2% at 20-minute intervals.
Total boiling time ..... 2½ hours

The B curve for each dyestuff except Irgalan Grey BL was obtained for a dyeing carried out on wool fabric by the dyeing method conventionally recommended by dye manufacturers, where again dye absorbed was calculated from spectrophotometric measurements of dye left in solution:

pH of cloth before start of dyeing 7.5
2% dyestuff
1% sodium bichromate
1% conc ammonia water, 26° Bé
5% ammonium sulfate
Raise temp to the boil in 45 minutes, boil 45 minutes and exhaust with 2% acetic acid, 56%.
Total boiling time ..... 80 minutes

The B curve for Irgalan Grey BL was obtained for a dyeing carried out by the manufacturer's dyeing method as follows:

pH of cloth before starting of dyeing ... 7.5
2% dyestuff
2% Irgasol A
Raise temp to 170°F in 20 minutes and add
3% ammonium sulfate. Run at 170°F for 20 minutes, raise temp to the boil in 25 minutes and boil for 60 minutes.

DISCUSSION OF CURVES

The ideal absorption curve for any dyestuff is one for which the rate of absorption (percent of total dye absorbed per short unit of time) at any part of the dyeing is not great enough to cause poor penetration or poor levelness. On the other hand, the rate of dyeing should not be so slow that the dyeing period to good exhaustion is extended to an impractical length. It is to be observed that all the A curves in the figures, however, have lower slopes, that is, they are in general not so steep as the B curves. Diammonium phosphate therefore reduces the rate of absorption appreciably throughout the whole dyeing period without reduction of the degree of final exhaustion of dye on wool and without undue increase of dyeing time. This slowing down of dyeing rate is particularly noticeable for Irgalan Grey BL during the boiling period.

PRELIMINARY INVITATION TO CONTRIBUTE TECHNICAL PAPERS AT 1953 CONVENTION

PREPARATIONS for the technical program at the 1953 National Convention, to be held in Chicago, Illinois, September 17-19, are now underway. Persons desiring to present a paper should proceed according to the following established instructions and regulations:

(1) Notify Elliott Morrill, Convention Technical Program Chairman, The Best Foods, Inc, 1437 West Morris Street, Indianapolis 6, Indiana, as soon as possible, giving the title of the proposed paper. The time required for the presentation should be stated (30-45 minutes).

(2) When the number of papers available is known, a selection will be made by the Committee, and the contributors will be advised as to whether their papers have been accepted. The program must be completed as soon as possible in order to assure the best possible arrangement of the papers and to provide adequate time for publicity.

(3) An abstract of the paper will be required in advance of the program. Contributors will be notified of the date on which this abstract is required.

(4) Copies of the completed paper must be in the hands of the Technical Program Chairman by the first week of August so that the necessary arrangements for prompt publication may be set in motion. Earlier submission will be appreciated.

(5) Papers must not be primarily of advertising or promotional character. However, the subject matter may consider commercial products, machinery, instruments, or processing procedures of a commercial nature, provided that they are evaluated from a technical viewpoint.

(6) The Technical Program Committee must be the final judge as to which papers are to be accepted, but every effort will be made to include all suitable contributions in the program.

Southeastern Section ———

BEAM DYEING*

Controlling Beam Density by a Study of Flow Rates

JAMES H STRADLEY

E I du Pont de Nemours & Co, Inc
Atlanta District Office

INTRODUCTION

THE quality of a beam dyeing is most often directly traceable to the suitability of the warped beams for proper circulation of dye liquor. Beams can be either too hard, too soft, or approximately correct for dyeing. The desirable intermediate stage is somewhat obscure until the beam is dyed and examined. Many of us have pushed, prodded, and slapped beams as a means of satisfying ourselves with respect to their proper density. This proves nothing to anyone, except possibly ourselves, and usually contributes nothing towards controlling the density of the next set of beams.

Because of the difference between the physical properties of a warped beam and a wound package, the difference in resistance to flow is considerable. Whereas it is possible to circulate liquor at the rate of 3 to 5 gallons per pound of cotton per minute through packages at the low pressure of 15 to 20 lb per square inch (psi), it is not practical, because of the likelihood that beams will blow, to circulate more than 1.5 to 2 gallons per lb per minute through beams. On the other hand, the rate of flow has to be sufficient to insure level dyeing.

The margin of difference between a rate of flow adequate for level dyeing and a rate that is excessive and may cause blowing of a beam is quite narrow. The minimum rate of flow for level dyeing does vary, of course, with the type and selection of dyes. Yarn count, number of ends, and total yardage or weight of yarn also influence the workable limits.

Present beam-dyeing machines vary widely in pump ratings and control features. These variables influence the degree of resistance to flow that may be warped into the beam. Machines are normally designed with pumps of sufficient volume and head to overcome the usual degrees of warped-in resistance. However, even with the most powerful pumps there are instances where the resistance to flow warped into a beam exceeds the ability of the pump to circulate dye liquor at a sufficient rate. The operation of powerful pumps at excessive pressures is not conducive to the best results in dyeing, as excessive compression of yarn against beam barrel and heads on outside-in cycles can cause light or undyed sections. Most beam-dyeing machines are equipped with a by-pass and/or throttle valve to reduce the rate of flow through the beams. However, other machines are not equipped with either device. In the latter case, the dyer has no control over the rate of flow through the beam but is wholly dependent upon the warpers to deliver beams of consistent density, which will permit adequate but not excessive flow within the performance range of the pump.

Practically all machines are equipped with pressure-indicating gauges, which show resistance against flow from the pump in pounds per square inch. These can be used only as a relative guide in controlling beam density. When the gauges are installed to show both positive and negative pressure, somewhat more reliance can be placed on the results.

Machines are sometimes equipped with flow meters, from which the influence of the beam on rate of flow is readily ascertainable. It is then possible to adjust the operation of the machine and warping conditions to obtain the required rates of flow. Several types of flow-measuring devices for pressure machines are available. The orifice type is considered to be most accurate, but it requires a long straight run of pipe, which is usually in excess of that easily available. The cost of repiping and of other mechanical changes required for adaptation of the machine to the orifice-type flow meter is generally prohibitive.

Differential pressure cells are a newer development and are sufficiently accurate for this purpose. The unit is versatile in application and can be installed either in straight pipe or in pipe elbows.

Still another method of finding rates of flow is based on the amperage load on the motor, which can be interpreted in terms of gallons flow per minute for a particular pump from the performance curve obtainable from the pump manufacturer. Only an ammeter on the motor and pressure gauges are necessary for carrying out this kind of measurement, which is the least reliable of the three methods suggested here. This method is not applicable for machines that are equipped only with a by-pass for relieving the force against the beams. It is usable, however, where pressure and flow are controlled with a throttle valve and/or variable-speed pumps.

J H Stradley

The quality of the dyeing obtainable on cotton yarn in any type of circulating machine is dependent to a great extent upon the rate of flow of dye liquor through the yarn. A satisfactory rate of flow is much easier to attain through packages than beams without damaging the winding, that is, beams are subject to blowing if the rate of flow is above two gallons per minute per pound of cotton. The author explains how the flow of liquor can be studied in various beam-dyeing machines to obtain satisfactory winding and conditions of flow.

EXPERIMENTAL

AMPERAGE METHOD —— We have had the pleasure of co-operating with several plants in the control of warping conditions by control of flow. The amperage method of measuring flow was used in several instances with revealing and satis-

*Presented at the Biltmore Hotel in Atlanta, Georgia, on September 13, 1952.

factory results. A typical set of conditions as they developed in one plant will illustrate the amperage principle. Through the use of data developed by this method, it was possible to warp beams with 274 to 420 ends to give the required rate of flow at the dyeing temperature.

The warper in use was installed for winding section beams some time before the plant went into the use of dyebeams. It was of a drum-driven type without either tension or let-off motion. The more modern warpers equipped with dye-beam attachments are of course preferred, but they too require close control for consistent results.

The dye plant consisted of three double-kier 500-pound dyeing machines. The pumps on the 500-pound units were rated at 1600 gallons per minute (gpm) and were driven by 40-HP motors. The machine was equipped with a throttle valve between the pump and a 4-way valve for control of pressure and flow. The pump was described by the manufacturer as follows:

Type:	centrifugal
Runner size:	11-inch diameter
Horsepower:	40
Amperage:	39.8
Capacity:	1600 gal per min
Head:	90 ft.

He also gave the following data relating pump delivery to power consumption:

Horsepower	*Gal Per Min*
40 (39.8 amperes)	1600
39	1210
38	1025
37	925
36	850
35	800
34	780
33	760
32	740
31	725
30	700
29	680
28	650
27	640
26	620

From the above manufacturer's data for the performance of the pump, from ammeter readings on the pump, and from gauge pressure readings for various settings of the throttle valve, the following relations were obtained between pressure in pounds per square inch (psi) and flow in gals per minute (gpm) for inside-out circulation through a beam:

psi	30	35	40	45	50
amp	31	33.5	35	35.5	37
gpm	720	770	800	845	925

TABLE I
EFFECT ON NUMBER OF ENDS ON FLOW THROUGH BEAMS

Yarn Number	20		16		16		16	
Ends	311		274		374		420	
Yardage	13,000		12,000		9,000		8,000	
psi	40	50	40	50	40	50	40	50
gpm	795	925	725	780	695	780	695	735

TABLE II
EFFECT OF BEAM DENSITY ON FLOW THROUGH BEAMS

Beam No.	1	2	3	4
Yarn No.	16	16	16	16
Ends	420	420	420	420
Yardage	8,000	8,000	8,000	8,000
Warping Speed, yd/min	200	160	150	200
Tension*, On	x	x		
Tension, Off			x	x
Contact Angle, Lower**				x
psi	40	40	40	40
gpm	680	695	740	825

* Tension caused by a weight on each yarn end at creel.
** Angle of contact between driving drum is lowered to reduce weight on yarn and thus to reduce density of beam.

It can be seen that, in general at both 40 and 50 psi in Table I, resistance to flow increased with increase in number of ends, that is, the more ends, the less flow; the behavior, however, was not wholly regular as can be seen from the fact that the beams with 374 and 420 ends both gave a flow of 695 gallons at 40 psi.

To illustrate further the effect of warping conditions on flow of liquor through dye beams, the data shown in Table II were developed by varying conditions within the limits of the particular warper.

WARPING CONDITIONS AND FLOW ——The cloth constructions in use required loom beams made up of 548, 622, 788, and 840 ends, which were slashed, respectively, from two dye beams each consisting of 274, 311, 374 and 420 ends. The yardage per dye beam varied from 13,000 yards for the beams with fewer ends to 8000 yards for the dye beams with 420 ends. All beams weighed approximately 250 lb net without regard to style. The effect of warping conditions for these beams on the resistance to inside-out circulation at different pressure points was determined in Table I for different rates of flow where rate of flow was found from ampere readings as already explained.

From Table II it is plain that flow through beam was increased by reducing warping speed (reduces tension on yarn), by direct reduction of tension on yarn, and especially by lowering contact angle, which has more effect than change in warping speed. On this particular warper, lowering the contact angle has more effect on lowering beam density than any other factor.

CONCLUSIONS

Because warped dye beams are subject to blowing at high circulation pressures, the range of yarn densities within which successful dyeing is possible is much narrower than for packages. It is therefore most important to have a knowledge of the range of rates of flow in gallons per minute per pound of yarn within which successful dyeing without blowing of beams can be obtained on a particular installation. It is equally important to know how warping conditions effect resistance of beams to liquor flow. It is advantageous to have these various facts in systematic understandable form for presentation to management, and our hope is that our work here will help in that direction. Our concluding hope is that someone will continue this study and relate actual density of wound yarn (on beams) in terms of cubic inches per pound of yarn to rate of flow of liquor at various pressures and to warping conditions.

New York Section Meeting Report

February 27, 1953
Hotel Statler, New York

A MEETING of the New York Section was held on Friday evening, February 27th, 1953 at the Hotel Statler, New York City. An informal dinner preceded the meeting.

The Chairman, Weldon G Helmus, called attention to the notice currently appearing in the *Proceedings* inviting technical papers for the 1953 National Convention to be held in Chicago. Dr L H James, a visitor from the Mid-West Section, was introduced. The Chairman announced that the next meeting, on April 17th, would be held at Fairleigh Dickinson College in Rutherford, New Jersey jointly with the Student Chapter.

Charles E Crompton, Radioisotopes Branch, Isotopes Division, Oak Ridge, Tennessee presented a paper entitled "The Use of Radioisotopes in the Textile Industry" which was illustrated by slides.

The attendance was approximately 125.

Respectfully submitted,
NORMAN A JOHNSON, *Secretary*

NOTICE TO AUTHORS OF PAPERS

MANUSCRIPTS for the *Proceedings* and for other publications of the American Association of Textile Chemists and Colorists shall conform to the requirements and standards given in this *Notice.* Before publication, manuscripts for the *Proceedings* shall be approved by the Editor, not only for editorial correctness according to the standards of this *Notice,* but also for content of technical matter. In his work, the Editor may enlist the aid of anonymous reviewers who are selected for expert knowledge in particular fields.

It is presumed that authors in studying the comments of reviewers and of the Editor will remember that all recommendations are made in a kindly, helpful, sympathetic manner to improve the paper in both literary and technical excellence. Although authors should cheerfully consider suggestions, they are expected to defend their position if justified, especially when strictly technical matters are involved with which the authors have an intimate knowledge.

MANUSCRIPTS—Manuscripts shall be typewritten double-spaced with approximately one-inch margins on 8.5 x 11-inch white paper. In addition to the original, at least one carbon copy is required. Pages are to be numbered consecutively with Arabic numerals, and each page after the first shall carry the authorship at the very top. Tables and figures shall also be numbered consecutively, the tables with headings containing Roman numerals as TABLE I, TABLE II, etc, and the figures with Arabic numerals as Figure 1, Figure 2, etc, appearing *below* the figures. The names of the authors and their laboratories or business connections should appear below the title of the paper.

ARTICLES APPEARING IN THE "PROCEEDINGS" IN RECENT ISSUES OF THE "AMERICAN DYESTUFF REPORTER" will be helpful to authors as models of form for the typing of manuscripts.

LITERARY STYLE AND FORM OF PRESENTATION—In the writing of papers, authors are requested to observe a trenchant, simple style of writing directed to textile chemists and colorists with at least an elementary knowledge of chemistry, physics, mathematics, engineering, textile processes and textile machinery.

In the organization of the material, there should be one or more introductory paragraphs setting forth the occasion, significance and main objectives of the paper and of the method of attack. This should be followed by the body of the presentation, either with discussions interspersed throughout this portion or with a collected section marked "DISCUSSION" after the main body of the paper. Finally, there may be a brief section at the end entitled "SUMMARY" or "CONCLUSIONS."

Center and side headings make for easier reading. Center headings should be employed sparingly and generally will include only very important section headings, such as "INTRODUCTION," "EXPERIMENTAL," "DISCUSSION," "CONCLUSIONS," "SUMMARY," and "REFERENCES." Side headings (see third paragraph of this *Notice* for an example) shall be indented and run into the text to which they apply, and shall be separated from the paragraph by a dash. The publisher will print center headings in bold-face capitals and side headings in capitals.

LITERATURE REFERENCES AND FOOTNOTES—References to the literature and all footnotes (except those in tables) shall be numbered consecutively with underlined Arabic numerals in parentheses at the proper place in the text. Where a reference or footnote is to be used again, the original number is simply repeated; this obviates the necessity of repeating the footnote or reference at the bottom of the page. References to the literature shall conform to the universal usages followed by *Chemical Abstracts,* which include underlining of book and journal names to indicate italicization in printing.

The spelling and rules of punctuation followed in manuscripts shall be those found in the *Merriam-Webster New International Dictionary;* abbreviations and chemical formulas shall conform to *Chemical Abstracts.* Periods shall be used only at the end of sentences, not after abbreviations.

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Photographs of authors should be included with copy, to be run in conjunction with the paper. These must be on glossy stock, and should be large enough for proper reproduction.

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SYNOPSIS—A separately written synopsis of not over 200 words containing the gist of the subject matter must accompany every manuscript.

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TRADE-MARKS — As the AATCC wishes to co-operate in the protection of trade-marks, it is requested that, in the body of the article, trade-mark names be written with an initial capital letter and that they be enclosed in quotation marks. At the first mention of a trade-marked product and at least once for every journal page thereafter, the trade-mark name shall be accompanied by the generic name as follows:

"Orlon" acrylic fiber
"Niagara" Blue 2B direct dye
"Orvus" ES Paste detergent.

Courtesy demands that authors include competitive products as well as those of his firm. Many current trade-mark names are to be found in the *AATCC Technical Manual and Yearbook.*

A LABORATORY HIGH-TEMPERATURE DYEING UNIT

FRED F JACOBS
Ciba Co, Inc

INTRODUCTION

THE high-temperature dyeing of textiles by means of pressurized equipment is becoming increasingly important. The dyeing of the newer synthetic fibers, particularly the acrylics, with certain existing dyestuffs can only be accomplished using temperatures considerably above usual dyeing temperatures.

This technique has been applied also to the natural fibers. By using temperatures above the boiling point of water, it is often possible to accelerate the dyeing cycle of natural fibers and to improve the uniformity when dyeing blends.

Dyeing above the boil in an aqueous media may be accomplished in pressurized equipment. In view of the difficulties of sampling and adding color while dyeing under pressure, however, the matching of shades on plant or laboratory equipment has been a persistent problem. It has become desirable, therefore, to develop laboratory equipment that will not only permit a quick determination of the dyeing formulas and conditions required for a high-temperature dyeing, but will also give results comparable to plant production.

FRED F JACOBS

DYEABILITY OF ACRYLIC FIBERS

The dyeing of natural and synthetic fibers is generally considered a function of three reversible physico-chemical processes, which occur simultaneously in the dyebath and tend towards a state of equilibrium between the dyebath and the fibers. The three processes are: 1) diffusion of the dye in the bath to the surface of the fiber; 2) adsorption of the dye on the surface; and 3) diffusion of the dye within the fiber. The actual occurrence of these processes is dependent upon the nature of the fiber-dyebath system and the rate is controlled by the temperature, agitation, and the concentrations of the components in the system.

In the case of the acrylics, the hydrophobic nature of these fibers has prevented the application of dyestuffs by the hitherto conventional dyeing techniques. It was necessary, therefore, to modify the dyeing system or dyeing conditions.

One modification of the usual dyeing process consists of the well-known copper-ion technique used for the commercial application of certain dyestuffs to acrylic fibers. Swelling agents, such as ortho- or

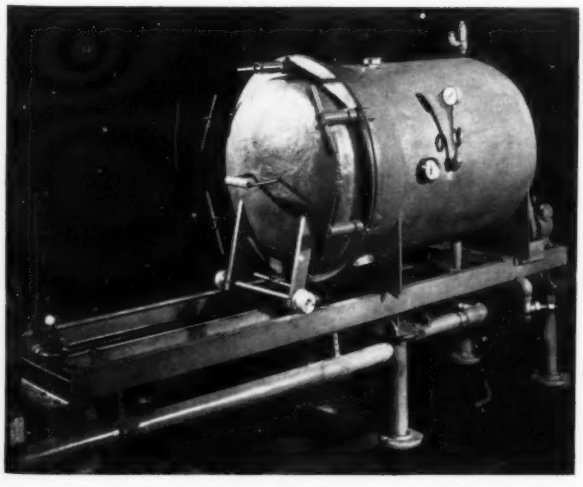


Figure 1
Closed Position of the Ciba High-Temperature Dyeing Unit

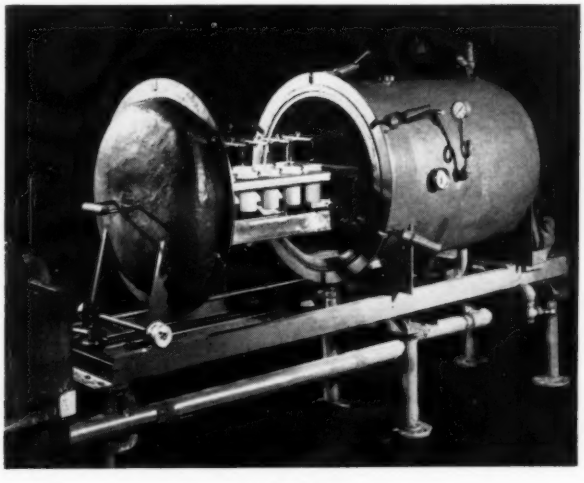


Figure 2
Open Position

para-phenylphenol, have also been employed to facilitate the attainment of the above-mentioned state of equilibrium, and permit the practical application of dyes to acrylic fibers without raising the dyebath temperature above the boil.

It has been found possible, however, to effect the economical application of a great many existing dyestuffs to the acrylic fibers by using temperatures up to 250°F. Dyestuffs that cannot be used at ordinary boiling temperature have shown excellent exhaust and good yield at temperatures of 250°F.

In a similar manner it has been found that the rate of dyeing cellulosic and animal fibers can also be increased by merely raising the temperatures above the boil while maintaining the other conditions of the dyeing system constant.

HIGH-TEMPERATURE DYEING EQUIPMENT

PLANT UNITS——A variety of pressure dyeing equipment to obtain high temperature dyeing conditions is commercially available. The Smith-Drum package machine and the Gaston County package and hosiery dyeing machines are representive.

The Barotor (Du Pont), designed for the high-temperature dyeing of piece goods, is the newest addition for batch dyeing.

Although there is no full-scale plant machinery available as yet for continuous dyeing of piece goods at high temperatures, a laboratory model has been designed abroad. Such a unit, essentially an adaptation of the Standfast molten-metal machine, consists of a steam chamber with a molten-metal seal at each end through which the cloth passes. As the temperature within the steam chamber is increased, the resulting pressure causes the molten metal to rise in a suitably arranged U-tube column.

LABORATORY UNIT——In order to cope with the problems associated with high-temperature dyeing and to facilitate research and development along these lines, a laboratory unit has been built to give maximum versatility—the Ciba High-Temperature Dyeing Unit*. It is said to offer the following unique features:

1) At least 12 high-temperature dyeings can be made simultaneously and under identical conditions.

2) Dyeings may be carried out on raw stock, yarn, or piece goods.

3) Dyeings may be made under time-temperature conditions which duplicate exactly those used in plant applications.

The above features render the unit useful for the performance of the following tasks:

1) Facilitating the determination of formulas for matching shades by carrying out a large number of different beaker dyeings at the same time.

2) Simultaneously determining the best dyebath concentrations or the best dye assistants under identical conditions.

3) Simultaneously carrying out the comparative evaluation of many dyestuffs for strength and shade and determining exhaust rate.

4) Judging the suitability of many different dyestuffs for a particular type of application during the time necessary for one dyeing cycle.

The actual construction and operation of the Ciba High-Temperature Dyeing Unit is comparatively simple. It is essentially an autoclave as shown in the closed position in Figure 1. In addition to the usual safety valve and pressure gage, the unit is also equipped with two thermometers, one for indicating the temperature of the steam in the unit, and the other (inserted directly into one of the dye beakers) for indicating the actual temperature of the dyebath. A typical pattern for the increase in temperature of the dyebath is indicated in Table I.

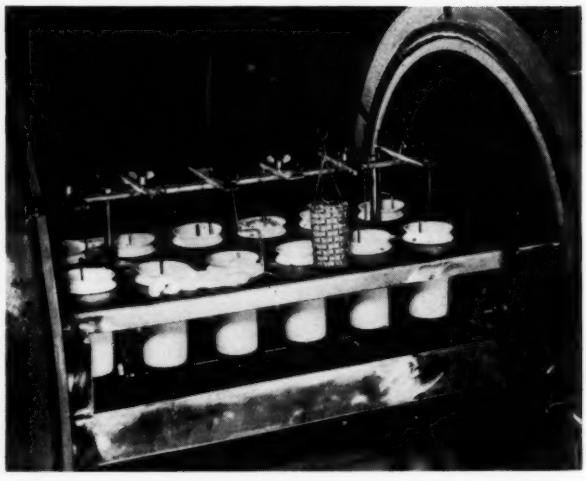


Figure 3
Close-up showing frame, dye beakers and agitation mechanism in detail

TABLE I
5-MINUTE TEMPERATURE READINGS

Dyebath °F	*Steam* °F
100	156
120	156
130	157
140	175
150	180
160	180
170	180
180	185
190	192
200	210
210	215
230	235
240	247
250	253
252	255

From Figure 2, which shows the unit opened, it may be observed that within the unit a number of removable beakers are mounted on a frame. Into each beaker is inserted a stainless steel rod which is connected at the upper end to a cross-link. The cross-links in turn are connected to two vertical rods resting on eccentric cams which are rotated by a common horizontal shaft. When the unit is closed, the shaft is geared to a motor outside the unit which turns it at adjustable speeds over the range 10 to 20 revolutions per minute. As the shaft turns, the cams impart a reciprocating motion to their vertical riders, and a constant agitation of the dyebaths is obtained.

A close-up view of the frame, beakers, and agitating mechanism is shown in Figure 3. The horizontal shaft may be seen running through the base of the frame and the vertical rider on the left is shown in position on its cam. The stainless steel wire basket in the foreground may be used in place of the rods for the dyeing of loose fibers.

SUMMARY

The use of high temperature dyeing for textile fibers is becoming increasingly important. In view of the difficulties of sampling and adding color while dyeing under pressure, however, the matching of colors during this type of dyeing has been a persistent problem. By the use of the Ciba High-Temperature Dyeing Unit, the determination of laboratory formulations for matching shades is considerably facilitated and the results obtained may be duplicated on plant scale high-temperature equipment.

* Patent Applied For.
Built by the Liberty Machine Co, Paterson, New Jersey.

ABSTRACTS

Dyeing the Modern Synthetic Fibers

B Kramrisch, *Dyer* 108, 709-13, November 14, 1952.

Ardil and Vicara are both regenerated protein fibers, Ardil being produced in England from peanuts and Vicara in U S A from corn. Both fibers liberate formaldehyde in dyeing, which has a detrimental action on certain wool dyes. Chrome dyes are particularly sensitive, but this defect can be overcome by prechroming with 0.5-1 per cent sodium bichromate and 1-2 per cent acetic acid for ½-¾ hour at the boil.

Dynel is Vinyon N in staple form, and is a copolymer of vinyl chloride and acrylonitrile. It is made in U S A and differs from the French fibers, Rhovyl, Fibravyl, and Thermovyl, which are 100 per cent polyvinyl chloride. Rhovyl (filament) and Fibravyl (staple) show marked shrinkage at temperatures over 60° C. Thermovyl is in staple form and is "heat-set"; although more stable to heat than Rhovyl and Fibravyl, it is still not perfect. Dynel is a marked improvement and shows virtually no shrinkage even at 100° C.

Dynel can be dyed with the acetate dispersed dyes (Cibacetes), apart from navies and blacks, without further addition, for 1½ hours at the boil. This type of dye does not migrate as well on Dynel as on acetate or nylon, and therefore care has to be taken in application. These dyes do not always give the same shade on Dynel as on acetate, and they exhaust at a slower rate. The fastness to washing is very much better on Dynel than on acetate or nylon, but the light fastness tends to be somewhat lower. The blues are fast to gas-fume fading in contrast to acetate.

Selected acid dyes are used where better fastness to light is required, and they also give good fastness to washing. The cuprous ion technique is employed, and a swelling agent, p-phenylphenol, is added.

Dynel loses some of its luster during dyeing, and relustering is carried out by heat treatment for 15-20 minutes at 120° C. Temperatures in excess of this are to be avoided, otherwise shrinkage takes place, and finally the material melts and chars.

Terylene (equivalent to Dacron) is derived from terephthalic acid, and its water up-take is very low compared with other fibers. As a result, very little swelling occurs in water and dyes are absorbed with difficulty. It has been found that certain organic compounds such as p-phenylphenol and m-cresol act as swelling agents and result in the production of heavier dyeings with the Cibacete-type dyes. These dyes are much faster to wet processes, such as washing, on Terylene than on acetate or nylon, and the blues are fast to gas-fume fading. The fastness to light, however, is often inferior on Terylene.

Orlon is an acrylic fiber of high resistance to acids, sunlight, and high temperatures. It has a low water up-take, being even inferior to Terylene in this regard, and is therefore difficult to dye. Cibacete-type dyes have some affinity for Orlon at the boil, although appreciaoly below that of acetate rayon. Little improvement is obtained by the use of swelling agents; better results are given at temperatures above the boil. Acetate blue dyes are resistant to gas-fume fading on Orlon. Acid dyes have practically no affinity for this fiber without a swelling agent, but selected products may be applied by the cuprous ion technique.

Two high-pressure machines are described by the author for dyeing synthetic fibers at temperatures above 212° F.—WHC

Fluorescent Dyes for Fabrics

A E Williams, *Textile Mercury & Argus* 127, 924-6, November 21, 1952.

The idea of utilizing fluorescence in spun materials is not new, and many years ago one investigator proposed to lay a yarn of fluorescent-dyed hemp among the other yarns in ropes, whereby the rope could be identified in ultraviolet light; for this purpose he used the sodium salt of the sulfuric acid of methylated Primuline base.

In recent years a considerable amount of work in this sphere has been carried on in the U S A by the Switzer Co which has produced fabrics of great brilliance. Some of the Switzer processes involve dissolving the fluorescent dyestuff in a solvent that has a swelling action on the fibers. For example, white acetate satin is immersed in a 50 per cent alcohol bath containing a colorless ultraviolet fluorescent dye, and then is over-dyed with Pontacyl Brilliant Blue RR in a formic acid bath. The result is a brilliant daylight fluorescent blue.

Fluorescent fabrics of various colors were used by the American Forces in World War II. A signal of fluorescent material laid on the ground can be observed by an airplane flying at an altitude three to four times higher than is the case with a similar signal of nonfluorescent material.

The author states that in the U S A fluorescent textiles are very popular; these include dresses, umbrellas, handbags, brassieres, and even shoe laces. Fluorescent flags are also being made.

The really strong fluorescent dyes belong to a few restricted classes, such as Rhodamine in the xanthene group; Euchrysine 2G in the acridine group; and Saframine in the azine group. The dyes must be used in a highly pure state, the purity having an important influence on the brightness. Investigations have indicated that if a dye is diluted with an electrolyte such as sodium chloride, this is liable to have a quenching effect on the fluorescence, especially as the material in which it is dissolved is a conducting material.

When correctly applied, the so-called "Day-Glo" fluorescent colors will re-emit as much as 120 per cent of the visible light falling upon them, whereas the brightest organic nonfluorescent colors will reflect only about 60 per cent. The extra brilliance is, of course, due to the sum of the light produced by fluorescence and that reflected from the visible spectrum in the ordinary way.

The evolution of fluorescent materials has resulted from a systematic study of the physical conditions determining maximum brightness. Thus, a strong solution of Rhodamine has little or no fluorescence, but a dilute solution exhibits strong fluorescence. Then again, to obtain maximum fluorescence the dye must be in solution of a particular type. For the treatment of natural fibers the solvent medium may be a synthetic resin, while with the various synthetic fibers it is possible to employ the latter in place of a resin.

A feature of most fluorescent dyestuffs is that they are activated far more intensely by ultraviolet light than by visible light.

The author describes apparatus which may be used for testing the degree of fluorescence of a fabric.—WHC

Bleaching of Rayon and Newer Fibers

Anon, *Dyer* 108, 563, 565, October 17, 1952.

For many years hypochlorite has been used extensively for cotton, although hydrogen peroxide is now used in a number of cotton bleacheries. Hydrogen peroxide is preferred for silk and is used to some extent on wool, but the reducing processes are still used on the latter fiber.

When rayon came on the market, both the yarn and piece goods sections of the textile trade divided among themselves on choice of bleaching agent; some preferred hypochlorite and others peroxide. It was soon established on a sound scientific basis that both could be used with safety, providing sensible control of the processes was maintained.

Nylon requires little bleaching to im-

prove the white of the fiber as produced, but the presence of impurities such as warp sizes, and the effect of setting, often necessitate thorough bleaching. In particular, dry heat-setting processes cause a certain amount of thermal oxidation and consequent discoloration.

Hypochlorite is not recommended for bleaching nylon, as chemical combination takes place followed by degradation on subsequent exposure. Three main methods of bleaching nylon are now in regular use: peroxide, sodium chlorite, and peracetic acid. Under most conditions, for the same degree of white, sodium chlorite and peracetic acid cause less loss in tensile strength than hydrogen peroxide.

Sodium chlorite is usually applied at 70-75° C from a bath containing formic or acetic acid to give pH 4. Peracetic acid is also used at 70-75° C, and the pH is adjusted to 6-6.5 with caustic soda.

New fibers during the early stages of development are often supplied to the trade in a discolored state, usually due to an inherent property of the polymer or polymers present. This has applied in the cases of the American-produced fibers dynel, Orlon, Acrilan, and Dacron. It is also said to apply to the American Cyanamid acrylic type Fiber X-51. Bleaching is not necessarily the answer to the problem of improving the white. Main improvements will probably be associated with the processes connected with the production of the polymers.

The regenerated protein fibers, Vicara, Fibrolane, and Ardil, as sold are also offwhite and in some cases tend to be a full cream in color. A major improvement can be made by treating with peroxide under controlled conditions.—WHC

Progress Report on Terylene

Anon. *Textile Recorder* 70, 66-7, November, 1952.

Terylene combines seven outstanding properties for apparel uses: (1) it is warm to the touch; (2) it has a low stretch in the filament yarn; (3) it is crease-resistant and will keep its shape, wet or dry; (4) it is very easily washed, is quick-drying and requires no ironing; (5) it has a high tenacity (or strength) and a high resistance to abrasion (or rubbing); (6) it is mothproof, mildewproof, and immune to attack by other insects and bacteria; (7) it has exceptional resistance to weather and sunlight, especially behind glass.

The staple fiber is being introduced in the textile industry for socks, underwear, and knitted outerwear, as well as suitings.

Among the industrial applications now being developed for the fiber the following may be mentioned: For the chemical industries there are filter cloths, safety belts, acid-resistant clothing, and anode bags. The electrical industry uses insulating sheet, tape, and twine, wire lapping, braided covers for flexes, and core threads. Towing hawsers, fishing nets and lines, and sail cloth are typical maritime applications. The rubber industry is examining the possibilities of Terylene for tire cords, V-belts, fire hose, and collapsible containers.

Miscellaneous uses include laundry bags, sheetings, sewing threads of all kinds, overalls, laboratory coats, curtains, tents, and awnings.

(Note: this article should be of interest because Terylene is the British equivalent of the American fiber Dacron.)—WHC

The Behavior of Nylon Oxford Cloth "41" on Pyrolysis

T Hasselstrom *et al*, *Textile Research J* 22, 742-8, Nov, 1952.

The authors quote from a Research and Development Report of the U S Army Quartermaster Corps, as follows:

"In lightweight tentage a problem has arisen which has not been successfully solved and which extends as well to clothing. In the application of a fire retardant utilizing the metallic oxides, the nylon is seriously damaged. Accordingly, for a fabric of this type or any fabric utilizing nylon, a different kind of fire retardant treatment will be needed."

The present work described in this paper comprises an exploratory investigation for ascertaining what type of products are formed on pyrolysis of nylon 66, and whether the composition of these can be changed to render nylon nonflammable.

The authors conclude from this investigation that pyrolysis of the nylon fabric causes depolymerization of the polymer, and not cross-linking of the aliphatic polymer chains; and that the breaking of the polymer chain occurs not only at the —NC—bond, as reported by others, but also at the —CH_2—CO— bond.

Unscoured and scoured nylon fabric samples were impregnated with 22 different flameproofing chemicals used for other textiles, and heated to 400° C. It was found that most of these conventional flameproofing materials tend to increase the flammability of nylon. The exceptions were certain compounds containing sulfur or chlorine.

Eleven references to the literature are cited.—WHC

Copper Sulfate Reduction: Now, There's a New Way to Control It

R H Blaker, *Modern Textiles* 33, 56-60, November, 1952.

The only process now available by which Du Pont's Orlon can be dyed a full shade range at temperatures near the boil is the copper method. This is novel in that it employs chemical reactions which have never before been used in a dyeing procedure.

Late in 1950, the Union Carbide and Carbon Corporation disclosed that copper salts promoted the dyeing of dynel with acid dyes, but stated that the dyeability of Orlon was not changed. Further work, however, has shown that under proper conditions the dyeability of Orlon with acid dyes can be greatly increased by the use of copper salts.

The copper dyeing procedure is limited to the application of acid and selected direct dyes to acrylic fibers. The method consists of adding copper sulfate and a reducing agent to a bath containing the fiber and an acid dye and maintaining the bath at or very near the boil. The copper sulfate and the reducing agent react in the bath to produce copper in the cuprous valence state. Under these conditions Orlon, which normally shows no affinity for acid dyes, can be dyed a full shade range with satisfactory fastness properties.

There are five factors of primary importance to be considered: first, the copper is effective in promoting the dyeability only when it is in the cuprous valence state; second, the rate of absorption of cuprous ion, and hence of dye, is very slow below 212° F; third, the absorption of cuprous ion depends strongly on the pH of the dyebath; fourth, the amount of cuprous ion absorbed from a dyebath is proportional to the amount in the bath and to the bath-to-fiber ratio; and fifth, the amount of dye absorbed is proportional to the amount of cuprous ion absorbed by the fiber.

It has been found necessary to produce the cuprous copper directly in the dyebath through the reaction of a cupric salt, usually copper sulfate, and a suitable reducing agent. Hydroxylamine sulfate has proved to be the most useful reducing agent at temperatures near the boil.

The absorption of copper falls off rapidly if the pH of the dyebath is below the range of 2.0-3.0. At higher pH values more copper is absorbed, but the coppered Orlon has a tendency to become yellow if the pH of the bath is greater than about 3.0.

Recently, a process has been developed for controlling the reduction of the copper sulfate in which a wide variety of reducing agents are satisfactory. This process is based on redox potential measurements, and its application is described by the author.—WHC

NEWS

• Verona Chemical Opens New Division

The Verona Chemical Company, Newark, N J, has announced the opening of a new independent division, Verona Dyestuffs, Union, N J, which will specialize in fast colors. A full line of imported and domestic dyestuffs, intermediates and auxiliary products will be offered.

Personnel of the new division will be under the leadership of W L Swenson, Vice President in charge.

The Verona Chemical Company was founded in 1902 for the manufacture of fine chemicals. Since 1914 it has continuously manufactured dyestuff intermediates and some dyestuffs. E K Halbach, president, now heads the organization.

• Geigy Adds to Leland Factory

A 12,000-square-foot addition to the Leland, Miss, factory of Geigy Company, Inc, was recently completed by the Luria Engineering Company.

The addition is a standardized one-story, steel-frame structure 100 feet long. It has three clear-span bays of 40 feet each. It is 16 feet high to the eaves and has corrugated steel sides and roof.

• Public Sees "Chemistry in Living"

Modern living as exemplified by products of the chemical industry was the theme of the group of chemical companies affiliated with the American Research and Development Corporation, who conducted an exhibit at the Dorothy Quincy Suite, John Hancock Building, Boston, Mass, on February 17th. This group of companies, including American Resinous Chemicals Corporation, American Polymer Corporation, American Monomer Corporation, Monomer-Polymer, Inc and Snyder Chemical Corporation, operates ten factories in the United States, Canada, Brazil, England and Israel.

One of the features of the exhibit was Miss Polymer of 1953—an attractive model whose entire wardrobe from her felt hat to her suede shoes exemplified products of the American Polymer Corporation.

• CCDA to Meet March 23rd

"Economics and Commercial Chemical Development" will be the subject of the March 23rd meeting of the Commercial Chemical Development Association at the Hotel Statler, New York, N Y, at which Richard B Schneider, vice president of Empire Trust Company will preside.

The program for the day follows:

MORNING PROGRAM 10:00 AM

"Financing Chemical Expansion—The Dow Company Philosophy"—Carl Gerstacker, *Treasurer,* Dow Chemical Company

"Expansion by Acquisition"—Ernest Hart, *Vice-President,* Food Machinery & Chem Corp

"The Investment Attitude Toward Growth Companies"—William K Beckers, *Partner,* Spencer Trask & Co

LUNCH 12:30 PM

"Influence of Government Regulations on Company Expansion"—C E Waring, *Vice-President,* Davison Chemical Corp

AFTERNOON PROGRAM 2:30 PM

WHAT IS A GOOD PROJECT FOR A CHEMICAL COMPANY? "Technological Considerations"—S T Ellis, *Vice-President,* Commercial Solvents Corp

"Marketing and Financial Considerations"—William H McLean, *Vice-President,* Merck & Co, Inc

"Coordination of Financial and Research Planning"—Thomas Vaughn, *Vice-President* Wyandotte Chem Corp

DINNER 7:00 PM

Introduction: Frank E Dolian, *Manager,* Market Development Dept, Commercial Solvents Corporation

1953 CCDA HONOR AWARD PRESENTATION

Charles W Walton, *President,* CCDA and *General Manager,* Adhesives & Coating Div, Minnesota Mining and Manufacturing Company.

Award Address—Kenneth H Klipstein, *Assistant General Manager,* Calco Chemical Division, American Cyanamid Company

• Acrylic Acid Available from Cyanamid

American Cyanamid Company announced on Feb 27th the availability of acrylic acid in trial-lot quantities. A useful intermediate for the preparation of fibers, plastics, warp sizes, adhesives and finishing agents for paper, leather and textiles, this monomeric material is offered as a 50 per cent solution in water. It is said to be stabilized by the addition of small amounts of hydroquinone.

A technical bulletin containing a review of literature on the product and heretofore unpublished laboratory data is available upon request.

During the past year Cyanamid has offered various derivatives of acrylic acid, including acrylamide, N,N'-methylenebisacrylamide and N-tert-alkylacrylamides.

• Allied to Build Research Lab in Jersey

General Chemical Division, Allied Chemical & Dye Corporation, has announced plans for the building of a large research laboratory at Morristown, N J, which will permit them to expand their research program and replace their present laboratory at Laurel Hill, N Y.

The new laboratory will be located on the outskirts of Morristown on Columbia Road, adjacent to Allied's Central Research Laboratory.

According to a General Chemical spokesman, the transfer to Morristown will enable the Division to intensify activities in its specific fields, as well as permit better coordination with those phases of the Corporation's Central Research program which are related to the Division's particular interests.

General Chemical is an important producer of mineral acids and other industrial chemicals, laboratory and reagent chemicals, and fluorine chemicals both organic and inorganic. Agricultural chemicals represent another major group of the Division's products.

Plans for the new research center call for a modern, functional laboratory building of three-story brick construction. The new facility will have 50,000 square feet of floor space and be equipped with the latest types of physical equipment, including electron microscope and infra-red spectographs, library, etc. Construction estimates were not revealed, but an expenditure of about $2,000,000 was indicated.

It was emphasized that the new center will confine its activities to laboratory research.

Luiz La Saigne (right, dark suit), President of Mesbla, S A, distributor for GAF's Ansco photo products, entertains the New York models of "La Sinfonia del Color" at his home overlooking Rio harbor.

Two of the models visit the textile plant of Yarur, S A in Chile. Vice-president of the company is Amador Yarur, second from left. The other three men are executives of M Hochschild & Cia, Ltda, chemical laboratories and distributors of General Aniline & Film Corp's dyestuffs and textile chemicals.

• GAF-GDC Promotion Team Completes South American Trip

A promotional "package" to dramatize to other countries the coordinated workings of the U S textile industries completed a 16,000-mile tour of Latin America on February 20th. The package was a high-fashion show called "La Sinfonia del Color", (Symphony of Color) sponsored by General Aniline & Film Corporation and General Dyestuff Corporation.

In ten countries, industrial and business leaders, textile designers, manufacturers and distributors, and top South American society leaders and government officials turned out to applaud the project.

Sinfonia was conceived for a dual purpose. The first, according to Jack Frye, president of GAF, was to "illustrate American coordination and know-how to our sister republics in combining textiles, design and color in high-fashion styling." On the fashion end, Lord & Taylor of Fifth Avenue joined the project by providing 42 complete ensembles selected from the creations of top designers. Two Lord & Taylor executives accompanied the show: Katherine Bensabat, head of their Latin American department, acted as fashion commentator (in Spanish and Portugese), and Henry Callahan staged the individual performances. Pan American World Airways and Panagra, co-sponsors of the tour, flew the entire show to 15 cities.

The second purpose was the sales promotion of dyestuffs. General John Hilldring, vice president in charge of foreign operations for GAF, planned the promotional campaign "to create public style and color demand on the one hand, and to spark distributor relations on the other—then bringing both to converge on the sales target, the converters and manufacturers of textiles."

"German and other European competition in dyestuffs is increasing," said General Hilldring, a former Assistant Secretary of State and Head of the Civil Affairs Division of the War Department. "The first important countermove was to publicize the name of an American firm, General Aniline & Film Corp, to the textile manufacturers and the general public.

"By arousing the interest of society leaders and fashion designers for bright, fast colors in high-fashion styling," the General stated, "we hope to start a demand in which GAF can best meet its competition."

"Bright colors (not always fade-proof) have been quite popular in the less expensive cotton textiles. But in the finer textiles and in high-fashion styling, South American women have preferred the more conservative black and white. Since only quality dyestuffs can give the best results in the better materials and synthetics, GAF—which concentrates on quality dyestuffs—can outrank European dyestuff products used for the lower grade textiles," Gen Hilldring said.

"What we needed," the General continued, "was a publicity medium to provide the maximum coverage and yet attract the top society, fashion and business leaders. A smart fashion show held for the benefit of local charities was the answer. And an amazingly successful answer it has proved. In one city alone, Caracas (Venezuela) 2000 people attended a single performance."

In many countries, showings of La Sinfonia del Color were given under the auspices of the Presidents' wives, e g, Mrs Darcy Vargas in Brazil and Mrs Ibanez del Campo in Chile sponsored showings. Such industrialists as Luiz LaSaigne, president of Mesbla, S A, reputedly Brazil's largest mercantile establishment and distributor of GAF's Ansco film; and Ermillio Matarazzo, president of Banco do Brazil attended. Even Juan Peron in Argentina sent special reporters to cover it. Audiences and press in the ten countries were consistently enthusiastic, it was reported.

Such successful publicity has, of course, heightened the interest and enthusiasm of the South American distributors of General Aniline & Film products, according to Gen Hilldring. Local distributor tie-in not only included the companies who handle dyestuffs through the General Dyestuff Corporation but also representatives for Ansco color film and photographic equipment and Ozalid reproducing equipment and sensitized paper. Additional sales promotion through local dealers acquainted the public with the role of dyestuffs in related industries and other GAF products.

In Brazil, Chile, Peru, Colombia, Mexico, Cuba and Puerto Rico, Ansco color film contests were held for the best photo of the "Ansco Girls," the New York models in the show.

Such distributor tie-in, General Hilldring points out, shows the local dealer the U S company is willing to go a long way to cooperate—to everyone's mutual profit. "But most of all," said General Hilldring, "Sinfornia del Color proved to the distributors that GAF is carrying through on a long-range promotion campaign as outlined by its international public relations counsel, Walker and Crenshaw, Inc."

• Nuodex Moves Executive Offices

Sales, executive and administrative offices of Nuodex Products Co, Inc, have been moved from Elizabeth, N J to new quarters at 1 Virginia Street, Newark, N J. The mailing address of the company, however, continues to be Elizabeth, N J.

The move was undertaken in the interests of better service to customers by consolidating operating functions under one roof, according to an announcement by Leo Roon, President, at opening ceremonies on February 6.

In addition to the sales and order departments, advertising, accounting and purchasing personnel have been transferred to Newark as have been the offices of Mr Roon, Arthur Minich, executive vice-president, and Donald Roon, Marketing vice-president.

The Research and Technical Service Laboratories, under the direction of John R Skeen, are being centralized in the Nuodex Research Building, 1075 Magnolia Ave, Elizabeth. This structure, now in the process of reconstruction, will be ready by April 1st, it is reported.

The main Nuodex plant remains at 830 Magnolia Ave, Elizabeth, along with the Control Laboratory and the offices of Walter Gotham, Production vice-president.

During the opening ceremonies, attended by office, laboratory and plant personnel, a booklet on the history of the company was distributed as a souvenir of the occasion. Later Mr Minich outlined the Company's future plans. A discussion of the employees' pension trust and a tour of the offices and plant concluded the program.

• GDC Sales Conference

Sales executives and technologists of General Dyestuff Corporation from various sections of the United States gathered on Feb 19 at New York's Hotel Statler to attend a sales conference and business meeting.

The sessions were addressed by John C Franklin, Executive Vice President and Sumner H Williams, Vic President and General Sales Manager. Jack Frye, President, was the principal speaker at the evening dinner session.

The entire group was taken on guided tours the next day through the General Dyestuff Laboratories at 435 Hudson St, New York, and the Grasselli, N J, plant of General Aniline & Film Corporation.

Representatives from Boston, Providence, San Francisco, Philadelphia, Charlotte, Chicago, Portland, (Oregon), and New York were on hand.

J B Henriques

• J B Henriques, Inc to Handle ICI Plastics Sales in U S

The firm of J B Henriques, Inc, 521 Fifth Avenue, New York, N Y, will handle the United States sales of plastics for Imperial Chemical Industries Limited of Great Britain. Concurrent with this appointment, which became effective March 1, Mr Henriques is taking over the sales of the Resale Chemicals Division of Arnold, Hoffman & Co, Incorporated, by whom he was employed for the past eight years as Vice President in charge of plastics and resale chemicals. The new firm will be located in the same office and will have the same staff that served with Mr Henriques in his former position.

• Gov Herter, L F Whittemore Speak at LTI's 50th Anniversary Exercises

Governor Christian A Herter of Massachusetts and Laurence F Whittemore, president of the New England Council, as the principal speakers at Fiftieth Anniversary exercises of the Lowell Textile Institute on February 11th, agreed that New England's future as a textile center must be determined by the people living in the area.

"The decision as to whether this industry stays here or leaves New England must be made by New Englanders themselves," Whittemore said. "The New England of tomorrow will be what we make it. All we need is the will to win!"

In projecting a similar view, Governor Herter, drawing attention to the expanded educational facilities at Lowell Textile Institute, asserted that "the training of our young people in engineering studies leading to their absorption by the textile industry is one of the ways in which we can help preserve the textile industry on a sound basis in Massachusetts and New England." He called for specialized training also in such fields as leather and paper engineering, plastics, and electronics as a means of establishing a sound diversification of industry in the area.

President Martin J Lydon of the Institute welcomed more than a score of guests and introduced them to the audience. Among those present were T Glenwood Stoudt, Textile Machine Works, Reading, Pa; Willard F Staples, president of Merrimack Manufacturing Co; Philip E MacLean, Onyx Oil & Chemical Co, president of the LTI Alumni Association; George T Metcalf and Edwaid T Pickard, representing the New England Textile Foundation and the Textile Foundation, respectively; Congresswoman Edith Nourse Rogers; Ralph Lowell, Sr; James A LeRoy, McLaurin-Jones Company; James H Hunter, vice president of the James Hunter Machine Company; Ralph K Hubbard, representing the National Association of Wool Manufacturers; Joseph A Erickson, president, Federal Reserve Bank of Boston; Thomas T Clark, president, Talbot Mills; and Lincoln Clark, Hockmeyer Brothers.

During the ceremonies, a copper box to be placed in the cornerstone of Cumnock Hall, the administration and auditorium building now under construction, was presented to Samuel Pinanski, chairman of the Institute's Board of Trustees, by Robert E Mulcahy, Student Council president. On display were many items recording the Institute's history and symbolizing its first half-century of progress which will be placed in the cornerstone.

• GDGA Business Meeting

In conjunction with their National Convention last month, The Garment Dyers Guild of America held an informal business meeting at the Carter Hotel, Cleveland, on February 13th.

Among the topics discussed were the Guild's advertising campaign, the Guild's membership in the American Association of Textile Chemists and Colorists, the proposed increase in postal rates and many sales promotion activities.

No technical matters were covered at the meeting, these being reserved for the Guild's semiannual clinics. The next technical clinic will be held in the plant of the Seneca Dye Works, Rochester, N Y, on June 12th and 13th. Friday morning (June 12th) will be spent studying the plant's operation and Friday afternoon will be devoted to a discussion of techniques, methods and procedures. The group will return to the plant on Saturday morning to see the results of the previous day's work and on Saturday afternoon they will again discuss the technical aspects. The afternoon sessions will be held in the Powers Hotel.

NAMES IN THE NEWS

E H Little

J H McConnell

J A Reilly

ELECTION of EDWARD H LITTLE as chairman of the board of Colgate-Palmolive-Peet Company, effective Feb 12th, and JOSEPH H MCCONNELL, as president, effective March 1, was announced following a meeting of the board of directors in Jersey City, N J, on Feb 12. Mr McConnell was also elected to the company's board of directors and executive committee. JAMES A REILLY, executive vice president in charge of soap sales, was elected a director. Mr Little has been president of the company and chairman of the executive committee since 1938. As chairman of the board, he will continue to serve as chief executive officer under an amendment to the bylaws adopted Feb 12. CHARLES S PEARCE and S B COLGATE are honorary chairmen of the board.

Mr Little joined the Colgate organization as a salesman in 1902 and became district sales manager in 1906. He joined the Palmolive Company in 1914, serving consecutively as district sales manager at Los Angeles and New York, then as New York divisional sales manager. In 1928, at the time of the merger of the Colgate and Palmolive companies, he was general manager in charge of foreign operations of the Palmolive Company and continued in that position until his election in 1933 as vice president of the Colgate-Palmolive-Peet Company in charge of sales and advertising throughout the world. He became president of the company in 1938. The pattern of Colgate's extensive foreign operations was largely established by Mr Little. World-wide sales of the company and subsidiaries reportedly have increased from approximately $100,000,000 when he became president in 1938, to more than $350,000,000 in 1952.

Mr McConnell served for over three years as president of the National Broadcasting Company before he resigned in December 1952. After practicing law for two years after his graduation from college, he joined the legal staff of NRA in Washington. Upon NRA's dissolution in 1936, Mr McConnell joined the New York law firm of Cotton, Franklin, Wright and Gordon (now Cahill, Gordon, Zachry and Reindel), which had the Radio Corporation of America as a major client. He joined the legal department of the RCA Victor Division in 1941, becoming general counsel in 1942, vice president and general attorney in 1945 and vice president in charge of law and finance in 1947. In January 1949, he was elected vice president in charge of finance of Radio Corporation of America, the parent corporation, and was made executive vice president of RCA in July of that year and president of NBC in October 1949.

A Colgate career man who has served more than a quarter of a century, Mr Reilly joined the company in 1926 as a Displayman. He rose through the ranks and moved all over the country as he successively held the positions of Assistant Salesman, Salesman, Sales Supervisor, District and Division Manager, Assistant to the Manager of the Soap Department, Sales Manager, Manager, Vice President in Charge of the Soap Department, and last year he became Executive Vice President in Charge of the Soap Department.

AT THE annual meeting of the Board of Directors of The Givaudan Corporation, E R DURRER was elected President of the company and its affiliate companies, Givaudan-Delawanna, Inc, Givaudan Flavors Inc, Sindar Corporation and Givaudan-Foreign, Inc.

Mr Durrer succeeds ERIC C KUNZ, who had retired from the active management of the company in 1947 when Mr Durrer assumed the executive management in his capacity as Executive Vice President.

The other officers elected by the Board are: F N BANGS, Vice President and Secretary; H F DUFFY, Treasurer; MAX LUTHY, Vice President in Charge of Production and Research; and R E HORSEY, Vice President in Charge of Sales. R E VICKLUND continues as Manager of Sales and Development of Sindar Corporation.

APPOINTMENT of CHARLES W SMITH as Works Manager of the Borden Company's Chemical Division plant at Bainbridge, N Y, has been announced by Willaim F Leicester, president of the division. Mr Smith had been assistant Works Manager since joining Borden's early in 1951.

Mr Smith has a background of ten years in the chemical and resin field. He is the son of C J Smith, a pioneer in the plastics industry in Bridgeport, Conn.

Borden's Bainbridge Plant produces synthetic resins and adhesives, manufactured caseins, small package glues and formaldehyde.

FIVE leading figures in the textile industry have been named to a newly-created advisory committee for Lowell Textile Institute.

Named were FRANCIS W WHITE, president of the American Woolen Company; G GORDON OSBORNE, president-treasurer of Warwick Mills; NATHANIEL M MITCHELL, president of Barnes Textile Associates; EDWARD T PICKARD, executive secretary of The Textile Foundation; and DAVID A TRAVIS, president of Traford Fabrics.

The special textile advisory board, formed to serve as liaison between President Lydon and the faculty and the textile industry, will report to him on current developments in the industry's organization, equipment, and manpower requirements, and will suggest expansion and refinement in the Institute's several curricula. The board will also make suggestions as to machinery and other equipment necessary for the continuing modernization of the laboratories and classrooms.

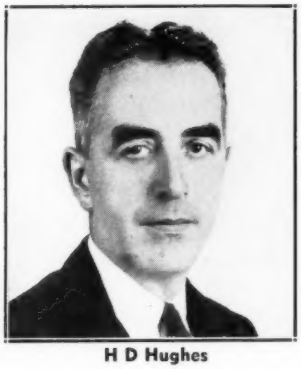
K H Klipstein

KENNETH H KLIPSTEIN, Assistant General Manager and head of the Technical Department of the Calco Chemical Division, American Cyanamid Company, has been announced as the 1953 medalist for the annual award conferred by the Commercial Chemical Development Association for outstanding accomplishment in commercial chemical development. The award is to be made at a dinner honoring Mr Klipstein following the annual open meeting of the Association on March 23 at the Statler Hotel in New York City (see page 179).

Mr Klipstein's twenty-nine years in the chemical field embrace a broad experience touching on many important phases of development activity. His early years at Calco were devoted to the formation of a group whose primary objective was to direct the Company's long-range efforts toward commercialization of the most promising new developments in its laboratories. In answering this challenge, Mr Klipstein had discussions of chemical marketing problems with other chemists and chemical engineers who, as a group, formed the nucleus for CCDA.

Mr Klipstein spent seven years in research with E C Klipstein & Sons, Inc, joining them in 1924. His career with Calco began with the merger of E C Klipstein & Sons, Inc, with Calco Chemical Company in 1933. His work on sales promotion at Calco was interrupted by the war, and from 1941 to 1945 he organized and managed the Priorities and Price Control Department of the American Cyanamid Company. His assignment on returning to Calco in 1945 was to take charge of the New Products Development program.

A second interruption in Mr Klipstein's career with Calco occurred in March, 1951, when he was appointed Deputy Director of the chemical division of the National Production Authority. Two months later he became Director, and on November 1, 1951, he advanced to the position of Assistant Administrator of the Chemical Rubber and Forest Products Bureau of the NPA. In 1952 he returned to Calco in his present capacity.



H D Hughes

E E Fogle

H D HUGHES has been appointed General Sales Manager and E E FOGLE, Sales Manager, of the Industrial Chemicals Division, Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation.

The appointment marks the return to the Company of Mr Fogle who has been on a 7-month leave of absence as Director of the Rubber, Chemicals, Drugs, and Fuel Division of the Office of Price Stabilization.

Both Mr Hughes and Mr Fogle are veteran chemical salesmen, Mr Hughes having joined Carbide and Carbon's sales department in 1928. For four years before that he was with a sister company in UCC, The Linde Air Products Company. During '42 and '43, Mr Hughes was Director of the Commodities Bureau, War Production Board in Washington. He became Sales Manager of the Industrial Chemicals Division in 1945. In his new position, he will co-ordinate the sales activities of the Company's 21 District Sales Offices.

Mr Fogle joined Carbide and Carbon through its research fellowship at Mellon Institute, Pittsburgh, in 1930. He became Cleveland District Sales Manager in 1940, Western Division Sales Manager in 1944, and Assistant Sales Manager of the Industrial Chemicals Division in 1947.

J D Farr

Emery Industries, Inc, Cincinnati, has announced the appointment of JOHN D FARR to their Development and Service Department.

Mr Farr has had considerable experience in vinyl plastics and synthetic rubbers with the B F Goodrich Company at both the Akron and Marietta, Ohio, plants.

In his new capacity, Mr Farr will be concerned with all development and technical service activities pertaining to Emery's Plastolein Flasticizers.

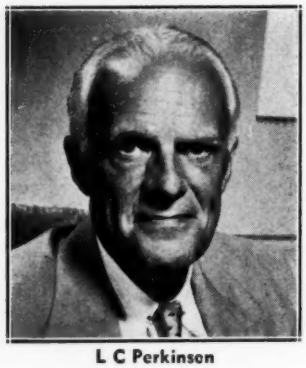
HEYDEN Chemical Corporation has appointed SCOTTY NEADER as sales representative, assigned to the Chicago District Sales Office.

DOROTHY M BRYANT and JEROME LINDER have become associated with Hooker Electrochemical Company as chemists in the development and research department. NEIL F TOMLIN has joined the company as a draftsman and ORMOND W GAY, as a mechanical engineer in the engineering department.

Miss Bryant worked previously as an analytical chemist for G Roger Wood in Vancouver, B C and as a control chemist for the Department of National Defense in Niagara Falls, Ontario.

Mr Gay was previously employed by Hooker from 1934 to 1947 as draftsman and engineer. Prior to his recent employment he has been with several firms in engineering positions and as an independent chemical consultant.

JOHN D FENNEBRESQUE, vice president and assistant to the president of Celanese Corporation of America, has been elected to the board of directors of the company. Mr Fennebresque joined the company in 1944, was general manager of the Chemical Division for several years, and was elected a vice president in 1951.



L C Perkinson

G C Walker

W O Neeb

L C PERKINSON has been elected Vice President and G C WALKER has been elected Treasurer of American Cyanamid Company, according to a February 20th announcement.

Mr Perkinson had been Treasurer of Cyanamid since 1945 and a Director since 1946. Mr Walker had been Assistant Treasurer since 1951.

Mr Perkinson joined the Hanover Bank in 1917 and practiced as a public accountant for a short period before becoming associated with Cyanamid in 1921. In 1939 he was elected Assistant Treasurer and Comptroller. He is a Director of Southern Minerals Corportation, and Jefferson Chemical Company, Inc and is an officer and/or Director of numerous Cyanamid subsidiaries.

Mr Walker joined Cyanamid's Accounting Department in 1933, became Assistant Manager of the Tax Department in 1939, and Manager in 1945.

WILLIAM O NEEB has been named Philadelphia area salesman for the Fine Chemicals Division of Pittsburgh Coke & Chemical Company. His territory includes Delaware, Maryland, most of Virginia, part of New Jersey and eastern Pennsylvania.

Mr Neeb was previously with Althouse Chemical Co, Inc, for three and one-half years. Prior to that he worked with Geigy Co, Inc in the Philadelphia area, and the Standard Silk Mills, Phillipsburg, N J.

His headquarters will be Room 203, 29 Bala Ave, Bala-Cynwyd, Pa.

NEW PRODUCTS AND DEVELOPMENTS

• PICC Developes New Basic Raw Material

Piccopale, a completely new synthetic resin, has been developed by Pennsylvania Industrial Chemical Company, Clairton, Pa. Reportedly available in huge quantities, this basic petroleum raw material is essentially a hard hydrocarbon produced by the polymerization of unsaturates derived from deep cracking of petroleum.

Available in three forms (solid, flaked and in solution), 100% polymerized Piccopale is a transparent thermoplastic. According to the manufacturer, it has good chemical resistance, ready solubility and compatibility with a wide range of products. The nature of Piccopale reportedly allows the manufacture, in volume and at low cost, of a material to fill the gap between petrolatum and petroleum rubbers in the following series: petroleum solvents, oils, waxes, petrolatums, Piccopale and petroleum-based elastomers and rubbers.

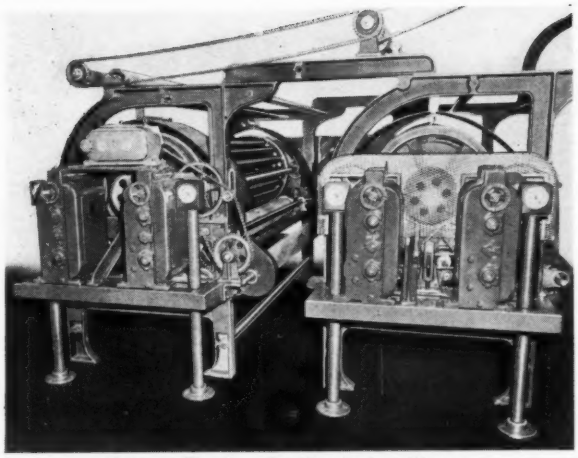
This material is available in four standard grades and in custom-made solutions and blends for large volume orders. The standard grades are: Piccopale 100, which is flaked or solid and has a melting point (Ball and Ring) of 100°C; Piccopale 85, a solid with a melting point of 85°C; Piccopale 70, a solid with a melting point of 70°C; and Piccopale 100 Solution, which is composed of 60% solids in mineral spirits.

Piccopale in Its Three Available Forms

Piccopale is said to be compatible with a wide range of products, including waxes, rubbers, polyethylene, coumarone-indene resins, phenolics, rosins and esterfied rosins, many alkyds and vinyls, and most drying oils.

Textile and floor covering uses suggested for Piccopale include the following: a *size* for wool carpets and rugs; a *nonskid backing* material; a *waterproofing* for mats from fibers, twisted paper, reeds, and the like; a *binder* in linoleum; an *impregnating* compound for felt base, especially where light color is desired for sandwich type tile; as resin content in *sealer* and *builder* coats for felt base; an ingredient in the print coat; *binder* component in asphalt tile; rubber *softener* in rubber tile; low cost *extender* in vinyl tile; *waterproofing* straw hats; *size* for felted and matted goods produced from textiles; *waterproofing* of oakum from processed wool; *coatings* for artificial leathers and oilcloths; *varnishes* for insulating and coated fabrics; *compounds* for mildew and damp proofing fabrics; *wax mixtures* and *waterproofing* for cordage and twine; *stiffener* and size for hat and cap materials; *compounding* aid for elasticized fabrics; *coatings* for raincoats, waterproofed outer garments and rubberized fabrics; synthetic sheetings for raincoats; *size* for curtains and draperies; *compounds* for canvas and tents; *size* and *waterproofing* for seat covers, banners, flags and the like.

Piccopale has been detailed in a brochure, which includes technical data on compatibility, solubility, chemical and physical structure and packaging, as well as specific information on its use with thirty-five different products. Copies may be obtained from Pennsylvania Industrial Chemical Corporation.



Gessner Tandem Double Acting Napper

• Tandem Napper

Adding to its line of fabric finishing machines, the David Gessner Co, Worcester, Mass has introduced a Tandem Double Acting Napper—two napping units operated as one machine with double the napping production, and with improved napping quality.

Gessner's Energy Indicators, again incorporated on this Tandem model, are said to give the operator precise control over napping never before obtainable on both cylinders at once. This control, made possible by the positive drives of the napping rolls, also extends to the positive drive which synchronizes the cloth feed between the two cylinders, permitting fine adjustment of the cloth tension.

The Tandem Napper can be arranged to deliver cloth to the rear, or to carry the cloth to the front of the machine for repeat runs.

• Two Popular Reagents Now Available to Laboratories

Amberlite IR-112 (H), a member of the family of "ion exchange" resins produced by Rohm & Haas, and S-143 Semicarbazine Hydrochloride are now available to laboratories through Fisher Scientific Company, 717 Forbes St, Pittsburgh, Pa.

Amberlite IR-112 (H) is distributed in laboratory quantities (up to 25 lbs) solely by Fisher, who distributes them in an analytical grade, specially purified and ready for immediate use in laboratory exchange columns. These tiny pieces of nuclear sulfonic acid have an acid strength about equal to sulfuric acid but with structures that permit only their hydrogen ions to move into solution. This feature, plus its unusually high porosity, makes Amberlite IR-112 (H) of importance in the treatment of non-aqueous fluids, catalysis of organic reactions, recovery of large cations from waste and process solutions, and operation in the hydrogen cycle.

S-143 Semicarbazine Hydrochloride is available in 25, 100 and 500 gram units.

• Boiler Level Indicator

To eliminate a common hazard in the boiler room, The Foxboro Company, Foxboro, Mass, has designed a 12"-dial, liquid-level indicator, which operates on the differential pressure principle. It can be mounted on a panel or pipe standard, bringing the dial to convenient eye level and enabling the operator to be constantly informed of water level conditions. Large white numerals and micrometer pointer against a dull black dial provide accurate reading even at a distance or in dim light. Readability is said to be unaffected by scale or boiler compound.

The Boiler Water Level Indicator is available in various standard ranges from 0-20 to 0-200 inches of water. It is stated that the forged steel body has a rated working pressure of 2000 psi and that parts are factory-tested for safety at 4000 psi.

Bulletin 392 contains complete information.

Foxboro Boiler Water Level Indicator

Lane Surreigh Cotton Interlock Sport Shirt

• New Permel Plus Application

Shrinkage control within 3%, reportedly achieved through the use of Permel Plus Finish, has been announced by Lane Surreigh for their cotton interlock shirts (see illustration). It is claimed that the shirts can be washed by hand or in home washing machines and can be spun, tumbled or hung to dry without impairing their fit.

Permel Plus Finish, a product of American Cyanamid Company, also provides resistance to perspiration and other non-oily stains and spots, and imparts wrinkle resistance, it is claimed.

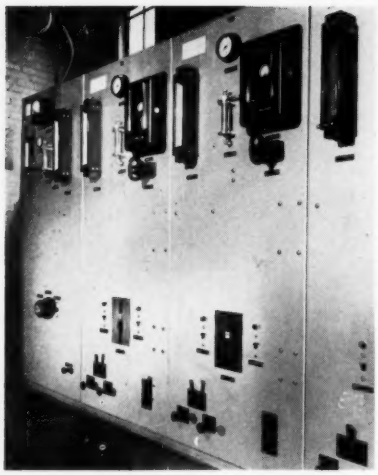
• Monaterge 289

Monaterge 289, an efficient, economical detergent-softener for high quality woolen and worsted knit goods, has been offered the trade by Mona Industries, Inc, 65-75 E 23rd St, Paterson 4, N J.

Monaterge 289 reportedly can be used in cold or hot water, with or without alkalies, such as soda ash or phosphates, with high or low water level in the wash wheel, so that felting and shrinkage can be avoided or controlled. For a normal wash run with goods of low oil content, the manufacturer recommends the use of cold or lukewarm water.

A load of 125 lbs in a wash wheel with a high water level of 150 gallons is said to require the addition of 1 to 2 lbs of Monaterge 289 to the washer and a washing time of only a few minutes.

The manufacturer states that, after the scouring bath has been dropped, the goods do not require any after-rinse and can be transferred immediately to the extractor.



Taller & Cooper Carbon Monoxide Detection Equipment

• Improved System for Toxicity Control

With the installation last year of a new improved carbon monoxide detector, New York City's huge municipal omnibus garage and maintenance center became equipped with one of the most efficient carbon monoxide control systems in the world, according to safety engineers who have observed the instrumentation in action. While the application of this new type of detector in this instance involves protection against carbon monoxide concentration in an automotive storage, repair and maintenance shop, it is pointed out that the instrumentation can readily be applied to detection, recording and control in connection with manufacturing, chemical processing or any other industrial use.

The system is completely automatic. It reportedly conducts continuous sampling and chemical analysis of air pumped from various areas in the depot, sounds an alarm when any analysis shows undue concentration of carbon monoxide, and keeps a permanent record of analysis results for future reference. This is how it works:

> Air intake tubes installed at forty-two points throughout the depot lead to a centrally-located analyzer unit, where the air is analyzed and the detector and recording elements of the system are housed. Air is drawn by vacuum pump thru the tube and into an improved type of cartridge air filter and charcoal tower which removes contaminants such as dust, suspended oil particles, hydrocarbons and acid gases. A cartesian manostate controls the rate of air flow which is measured by a rotometer.
>
> The air then flows into the analyzer cell where the carbon monoxide is converted to carbon monoxide. Heat generated in this exothermic reaction is proportional to the concentration of CO in the sample. This heat generates a voltage in a thermopile which is converted into a measurement of CO concentration in parts per ten thousand by a potentimetric recorder. Visual indication of the measurement and a continuous graphic record is provided and fan controls may be operated.
>
> This method reportedly circumvents the harmful effect which the presence of water vapor in the air has had on the accuracy of carbon monoxide analysis as conducted by past methods. It is also said to eliminate the handicap to accurate analysis hitherto imposed by use of air driers required by older systems.

The new detector-recorder registers variations as small as five one-hundreths of a part of CO in ten thousand parts of air, it is claimed. When the depot was built, it was equipped with a giant ventilating system with a blower output of 1,437,950 cubic feet per minute, permitting an air change every six minutes in the three million cubic-foot garage area on the first floor, every 12 minutes in the lower ceiling area and every 20 minutes in the higher-ceiling area of the second floor, and every 8 minutes in offices and classrooms.

The new detector-recorder system was designed and manufactured by Taller & Cooper, Inc, of Brooklyn. The system was installed by Michaels & Company, Brooklyn, N Y, electrical contractors for the depot.

• "National" Preformed Spectroscopic Electrodes

National Carbon Company, a Division of Union Carbide and Carbon Corporation, 100 E 42nd St, New York, has announced significant advances in the design, production and marketing of their spectroscopic electrodes. The Company is now shipping Preformed Spectroscopic Electrodes in high-purity packages in order to assure the manufactured purity of the electrodes after they leave the factory and until they are opened in the laboratory.

The eleven preformed shapes are said to meet the most exacting needs of spectroscopists and provide a range of sizes and shapes to satisfy the most widely accepted techniques. Volatilization of medium and large quantities of samples, general quantitative and qualitative work when complete volatilization of sample is required, general solution analysis involving relatively large samples, analysis of samples of high, medium and low boiling points, and porous cup analysis of solutions, are some of the applications for which the preformed shapes are designed.

It is stated that the basic rods from which preformed electrodes are cut are made in National Carbon's plant under the most rigid and exacting conditions of quality, contamination and uniformity control. After machining, the electrodes receive a 100 per cent inspection for flaws and are then purified. For complete information, write National Carbon for Catalog Section A-4004.

A Size Comparison of National Carbon's Eleven Preformed Spectroscopic Electrodes

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• New Process for Recovering Wool Wax

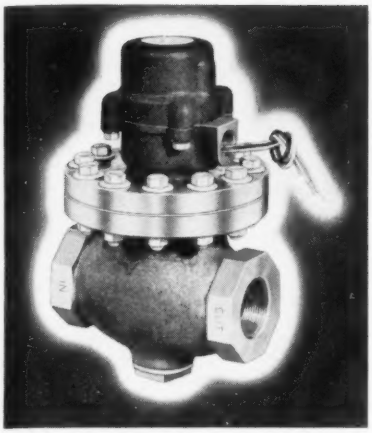
Greatly increased recoveries of wool wax from scouring liquors are claimed possible with a new process devised by the Division of Industrial Chemistry, Commonwealth Scientific and Industrial Research Organization, 314 Albert St, East Melbourne, Australia.

It is claimed that recoveries of 50 to 70% can be achieved, thereby considerably reducing extracting costs. Cost is said to be low with only a small amount of labor required to operate the plant.

The equipment for the process resembles that employed for the flotation separation of minerals from ores. The scour liquors containing the wax are fed progressively through a battery of cells fitted with impellors which concentrate the wax on the surface of air bubbles. A stable froth of high wax content forms at the tops of the cells, and the concentration of wax reportedly increases as the froth is propelled through the battery. The wax is recovered from the froth by centrifuging after dispersal in alkaline solution.

After most of the recoverable wax has been "floated" off, the residual liquors may be returned to the scouring bowls and their soap and soda content used again.

The final product reportedly complies with the requirements of the trade specification for a neutral wool grease.



Atkomatic Solenoid Electric Valves

• Solenoid Electric Valves for High-Pressure Applications

Normal valve maintenance is said to be considerably reduced with Atkomatic Solenoid high-pressure valves, designed with only three moving parts, no external linkage and an incorporated packless construction.

Made in sizes from ½ inch to 1½ inches and for pressures to 3,000 psi, Atkomatic Solenoid Electric High Pressure Valves can be used for any application where the media is not harmful to bronze or stainless steel, it is claimed. Coil housing for various conditions are offered in dust-tight, water-tight or explosion-proof housings for use in hazardous atmospheres.

A bulletin on these high-pressure valves may be obtained by writing to the Atkomatic Valve Company, Dept 216, 545 Abbott St, Indianapolis 25, Ind.

• Fabricated Laminex Tanks

Sturdy, corrosion-resistant fiberglas tanks in special sizes, now being fabricated by Laminex Corporation, 994 Jefferson St, Fall River, Mass, are said to be doing away with the cost of special molds.

The new technique of fabricating tanks from Laminex fiberglas flat stock reportedly costs less than aluminum and far less than stainless steel tanks to do the same job.

Laminex is now building tanks to order in all sizes from the smallest to a maximum of 12-foot length or width by 4-foot depth, or 12-foot length and width. Product is straight-sided and square-cornered, with all joints pressure-bonded, and engineered so that thickness increases for maximum strength in proportion as size and capacity are increased. Depending on size of the individual tank, the flat top flange varies in width up to 4" and in thickness up to ½".

The new fabricated tanks are said to be noncorrosive inside and out, electrically nonconductive, and able to withstand temperatures above boiling point. They withstand chemical attack from all commonly used acids in normal concentration, it is claimed, and walls of uniform thickness, reinforced with horizontal ribs where necessary, register extremely high impact resistance. Light weight (2′ x 2′ x 3′ tank weighs about 60 lbs) and ease of cleaning reduce cost of handling materials, it is pointed out, and ease and speed of repairs save money and operational time.

Laminex tanks may be fabricated without mold charge in any size to meet exact requirements, it is reported. If desired, they can be equipped with dam overflow and fittings, and the smooth interiors and exteriors can be impregnated with various permanent colors.

• "Rapisonic" Homogenizer

A machine based on the use of ultrasonic vibrations, developed by Ultrasonics Ltd, Bradford, England, and now available through Ultrasonics Company, 198 Pacific St, Newark, N J, should be of interest to those engaged in the making of emulsions or suspensions.

Known as the "Rapisonic" (patents pending), the machine is based on the principle of the Pohlmann whistle. Vibrations are brought about by a jet of liquid impinging on a blade which vibrates at its natural frequency. Both jet form and blade are enclosed by a resonant bell, which concentrates the local ultrasonic effect.

Emulsification is said to take place when cavities are swept out by the blade which oscillates at about 22 Kc—a frequency beyond the range of audition. On the collapse of these cavities instantaneous local pressures of the order of 30,000 lb/sq in are built up. This is the basis of the machine's efficiency.

The manufacturer states that the emulsions obtained using the "Rapisonic" are so fine that in most cases the amount of emulsificant can be reduced or, in some cases, left out altogether, an attractive feature where conventionally made emulsions contain an agent undesirable in the finished product.

The "Rapisonic" is said to have an output of 480 gal/hr and the additional advantage of being fully portable; it can be clamped on the side of existing mixing vessels. All parts in contact with the liquids are of stainless steel and other parts are made in light weight alloys wherever possible, to keep the power/weight ratio down to a minimum.

The frequency at which the blade vibrates can be easily adjusted, it is reported, and the machine as a whole has been designed for convenience of use and maintenance. The internal parts of the ultrasonic head can be dismantled by hand and cleaning takes only a short time.

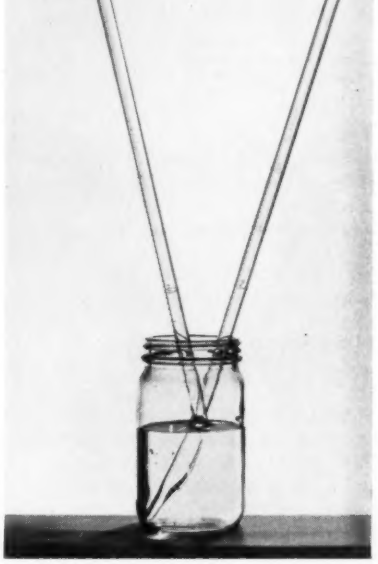
Cost of the machine is said to be only a fraction of that for other emulsifiers or homogenizers.

• Glass-Identification Test

An article in the December, 1952 issue of "The Laboratory," published by Fisher Scientific Company, 717 Forbes St, Pittsburgh, Pa reveals a quick way to sort glass in the chemical stockroom, check for soft glass before fusing two pieces of tubing (an inadvertent seal of soft glass and Pyrex-brand glass will crack), or demonstrate "refractive index" in the classroom.

Recipe: add 59 ml of carbon tetrachloride, 41 ml of benzene to a bottle and mix. *Result:* a solution with a refractive index of 1.472, about that of Pyrex-brand glass (i e, they'll both bend lightwaves in the same manner). When an assortment of pipettes is placed in the bottle, the Pyrex-brand pipettes will be invisible, the soft glass clearly outlined (see illustration).

"The Laboratory" attributes the method to Dr R E Black, associate professor of chemistry at the University of Kentucky. The journal points out, however, that other solutions are also popular, e g, use of five parts of benzene, one of ethyl alcohol (George Washington University chemical stockroom).



In a solution of 1.472 refractive index, Pyrex-brand glass is invisible, soft glass shows.

TECHNICAL LITERATURE

(All literature indicated in this section is available upon written request to the specified company or organization unless otherwise indicated.)

Aerotex Fire Retardants

Textile Resin Dept
American Cyanamid Co
30 Rockefeller Plaza
New York 20, N Y

This bulletin describes methods of applying Cyanamid's line of Aerotex fire-retardant finishes.

Aluminum Sulfate—Its History, Manufacture, Properties and Uses

Industrial Chemicals Division
American Cyanamid Company
30 Rockefeller Plaza
New York 20, N Y

Illustrated with charts and graphs, the booklet explains what aluminum sulfate (alum) is, and outlines its numerous industrial applications.

Sections of the booklet include: What is Alum; History of Alum; Manufacture of Alum; Properties of Alum; Alum in the Treatment of Municipal and Industrial Water Supplies; Alum in the Treatment of Sewage and Industrial Wastes; Alum in the Paper and other Industries; Alum Handling Systems, and Cyanamid Alum.

Hyfac 442 12-Hydroxystearic Acid and Hyfac Hydrogenated Castor Oil

Emery Industries, Inc
Dept 5, Carew Tower
Cincinnati 2, Ohio

This descriptive booklet contains the physical and chemical properties, specifications and suggested uses for these recently designated sales products of Emery Industries, Inc.

A complete bibliography is included.

Mitin Booklet No 6

Geigy Company, Inc
89 Barclay Street
New York 8, N Y

An innovation in retail sales education is introduced by Geigy with the publication of this retail sales booklet giving a simple and factual presentation of the selling features of woolen merchandise. The booklet is designed to meet the need for information at the retail level.

As producers of a component, or accessory, product not sold directly to the consumer, Geigy is offering information about its mothproofing product, Mitin, for sales personnel handling merchandise with which the Mitin tag is identified. It is believed this sort of training material is unprecedented.

"Our experience in marketing Mitin durable mothproofing has shown us that we must supply the sales person with more details than a hang tag can carry," reported C W Mahnken, director of product development for Geigy's dyestuff division. "Since the consumer is hardly able to memorize the genuine properties which have made a particular type of finish the sales feature that was intended, it is obvious that the sales person on the retail floor holds the manufacturer's fate in his hands."

The Geigy booklet gives the salesman of woolen merchandise a review of what "wool" means, and describes the performance properties as well as the weaknesses of animal-fiber fabrics.

Particular emphasis is given to the discussion of moth damage and mothproofing, contrasting the expense, labor and uncertainty of traditional home-applied remedies with the convenience of mill-applied durable mothproofing. It explains what durable mothproofing means as opposed to the loosely-used terms "mothproofing", "mothproof", or "mothproofed" which have long been employed in connection with products of varying effectiveness and limited duration. Constructive suggestions are also offered for the storage care of woolens not durably mothproofed.

Among the less commonly known facts included in this training booklet is the information that so-called "moth" damage actually attributable to 13 different species of wool-eating moths and beetles, continually exceeds the annual losses due to fire in the U S.

The company announced that it will furnish as many copies as will be required by the more than 1300 retailers presently carrying merchandise mothproofed with Mitin and will, as far as possible, fill all requests from stores interested in this educational program.

Twitchell Oils for Cotton Finishing

Emery Industries, Inc
Dept 5, Carew Tower
Cincinnati 2, Ohio

This new booklet is devoted primarily to the use of Twitchell Oils for finishing Sanforized fabrics. However, other finishing operations, such as regular finishing, finishing of absorbent fabrics, and warp slashing, are also discussed.

Specific data pertains to such special properties as rewetting speed, imparted softness, resistance to yellowing, and the "balance" of these properties in each product.

Also included are comparisons of these special properties with competitive products, data concerning the selection of the proper Twitchell Oil, and specifications of Twitchell Oils 7231, 7240 and 7250.

Irgalan Dyestuffs

Geigy Company, Inc
89 Barclay Street
New York 8, N Y

Individual bulletins containing the more pertinent features, dyeing procedures, characteristics and fastness properties of the following Irgalan dyestuffs are available on request:

Irgalan Grey B L
Irgalan Brown 2 R L
Irgalan Orange R L
Irgalan Brown 3 B L
Irgalan Yellow G L
Irgalan Olive B G L
Irgalan Brown 2 G L

Also available are bulletins displaying fashion shades on nylon and fashion shades on wool with the Irgalans.

The Irgalans, a new series for wool, nylon and pure silk recently introduced by Geigy, are said to possess excellent fastness to light and wet fastness properties approaching those of chrome dyestuffs. It is stated that the Iregalans, when used in combination, will work practically like a homogeneous dyestuff and will permit the production of a varied range of shades.

Color and Instrumentation

Sandoz Chemical Works, Inc
61-63 Van Dam Street
New York 13, N Y

This booklet by E W Rhael, which describes the fundamental principles of color and its measurement, has merited adoption by several of the leading textile schools and other educational institutions as a manual of instruction. Although written primarily for users of dyestuffs its treatment of abstract color is such that it has been distributed to the membership of the Inter-Society Color Council upon request of the directorate of that organization.